Pyorrhea

Its

Causes, Effects, Treatment and Prevention

ILLUSTRATED

THE DENTINOL & PYORRHOCIDE CO.
World's Tower Building
110-112 West 40th Street NEW YORK, U. S. A.

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PUBLISHERS' ANNOUNCEMENT

THE Dentinol and Pyorrhocide Company takes pleasure in offering these reprints of a series of articles which are a real contribution to the subject of treating pyorrhea. The publishers take the greater pleasure because much of the work necessary to elucidate this information was done in the Pyorrhea Clinics which its representatives have given in various parts of the country.

It is expected that the Pyorrhocide Post-Graduate Pyorrhea Clinic described in these pages will afford much new and valuable material for further publication.

The publishers' preparations are described in the back of the book.

P R E F A C E

MORE dentists are successfully treating pyorrhea than ever before. No small part of this advance has come about through the adoption of the methods described in the following pages.

The writer has taught these methods in many parts of the country, both by conducting clinics and by lectures. They are here published in concrete form for the first time.

It is the writer's hope that his efforts to preserve the true functioning power of the mouth, and to keep clean and healthy that portal of the body through which all of our food, and much of our disease, enters, may prove of practical value to his fellow members of the dental profession.

W. F. Spies, D.D.S.

CONTENTS

PRACTICAL ORAL PROPHYLAXIS

By W. F. Spies, D.D.S

THE term Prophylaxis means "to prevent" As here used it means to prevent diseases of the oral tissues, especially pyorrhea, or to so treat the tissues affected with that disease as to cause their return to health.

Before one can prevent a disease or treat it when present, it is necessary to know something about that disease and the possible methods of treatment. That means that every dentist who expects to apply the teachings of Oral Prophylaxis should at least know what pyorrhea is, should be able to recognize the manifest symptoms, and should know something about treatment methods that are proving successful.

Pyorrhea is inflammation of the tissues surrounding the teeth. Sometimes the inflammation is slight and then the name is not appropriate. Sometimes the inflammation is great, with loss of tissue and flow of pus. And then the name is appropriate; for pyorrhea means "pus flow." But whether little or great, the inflammatory process is all one. Under given conditions it follows a given course just as it would elsewhere in the body. The beginning forecasts the end, unless proper remedies are applied. Names more accurate than "pyorrhea" have been given it and should "stick," but somehow they do not. We shall herein use the common term, "pyorrhea."

The question of the constitutional causes of pyorrhea has been much discussed, and it is not the writer's intention to review the ground over which the battle has waged so valiantly. He has no doubt that constitutional causes sometimes play an important part in establishing inflammatory conditions of the tissues surrounding the teeth. Any derangement which lowers the resisting power of the body tissues may act as such a cause.

The writer questions whether constitutional conditions alone ever bring about pyorrhea. In any event, the dentist will find a wide field for activity in so freeing the mouth of local exciting causes that the proper health of the oral tissues can be maintained. The mere putting of the mouth into proper condition will often result in an apparent cure, even when constitutional conditions are unfavorable. But the writer has never known treatment of the constitutional conditions to produce even an apparent cure if the treatment of local conditions was not properly conducted.

The local causes which produce or help to produce pyorrhea may be summarized under the following heads: Deposits, mal-occlusion and faulty operative procedure.

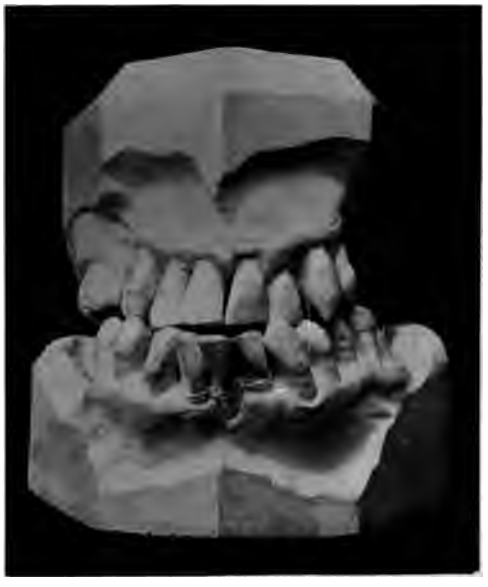
As the study of deposits, their nature, and effects, forms much the largest item in the papers dealing with the local causes, it may be well to dispose of mal-occlusion and faulty operative procedures first.

Note.—These articles were published in the *Dental Digest*, beginning in the February issue and continuing through the July issue, 1911.

MAL-OCCLUSION OF THE TEETH

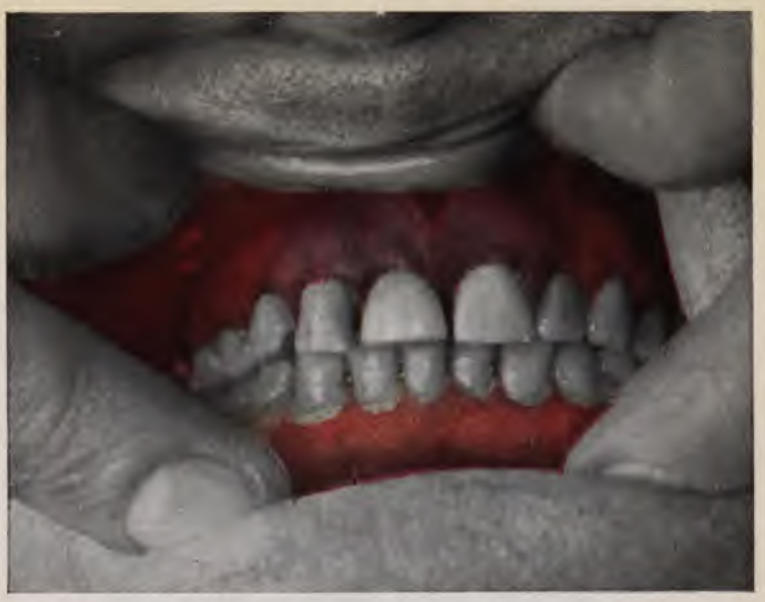
It was once thought that mal-occlusions of the teeth interested only the orthodontist, but with the advance of professional knowledge it is seen that they interest all dentists. For if the mechanics exhibited by the relations of one tooth to another immediately adjoining it are worthy of admiration, the relations between teeth opposed to each other are still more wonderful. Each tooth sits in a bony socket having rather frail walls. It extends a considerable distance out of this socket, and at the point of its furthest extension sustains heavy and complicated stress. When the tooth is in proper occlusion with the opposing teeth, this stress is so distributed by the occlusal planes or incisal edges, that no disturbance of the supporting tissues follows. But when the tooth enters a position of mal-occlusion, these very forces which before supported it in health, work it injury.

The tooth in mal-occlusion is generally the victim of undue lateral stress, often great in amount and frequently repeated. The effect on the lateral walls

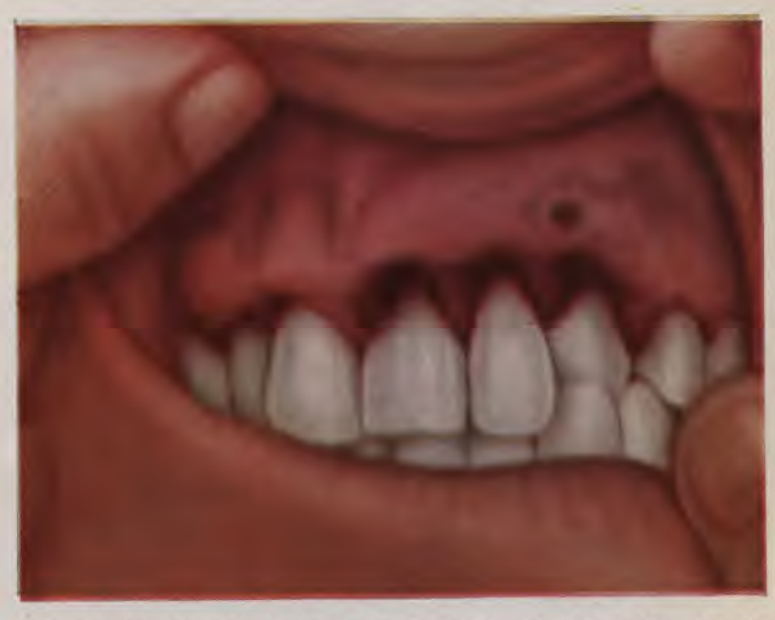


ILL. No. 1.—Extensive mal-occlusion, due to irregular eruption, aggravated by extractions. The gums about the upper central and laterals were highly inflamed, with fistulous openings above both centrals. Deep pockets about centrals. Gums about lower incisors showed marked inflammation. Deep pockets about roots; process extensively destroyed; great amount of pus.

of the alveolus is felt first by the peridental membrane and then by the osseous tissues. A common result is the partial or complete absorption of the lateral wall of the alveolus. A very common illustration of mal-occlusion, with resulting absorption of a lateral wall of the alveolus, may be found in the lower second molar when the first molar has been lost. This result is shown in illustration No. 6, page 11. A tooth in normal occlusion may be placed in mal-occlusion by an improperly articulated filling or crown. The effects on the tooth are then identical with those in the mal-occlusion referred to previously.



Photograph from patient. The upper centrals have been crowned with porcelain. Beautiful adaptation of crowns to roots perfected with porcelain copings. When these crowns were set, the tissues about the roots were in healthy condition. As the result of the centrals being subjected to excessive occlusion, inflammation of the soft tissues occurred, and extended to the underlying bony tissues. It caused destruction of the bone, pocket formation and large amount of pus. This condition was spreading to the laterals when treatment began.



Mal-occlusion of cuspid. Inflammation began about it, became chronic and extended to involve lateral and central. Extensive destruction of process about cuspid, with fistulous opening from pericemental abscess; the pulp is vital. Inflammatory condition extending to involve adjoining teeth.

The effects of mal-occlusion are not confined to the lateral stress which a h receives. There is a form of mal-occlusion known as "excessive occlu-," in which a tooth receives more than a normal amount of opposing stress. s subjects the peridental membrane to undue pressure. The effects of this sure are seen in an inflammation of the peridental membrane.

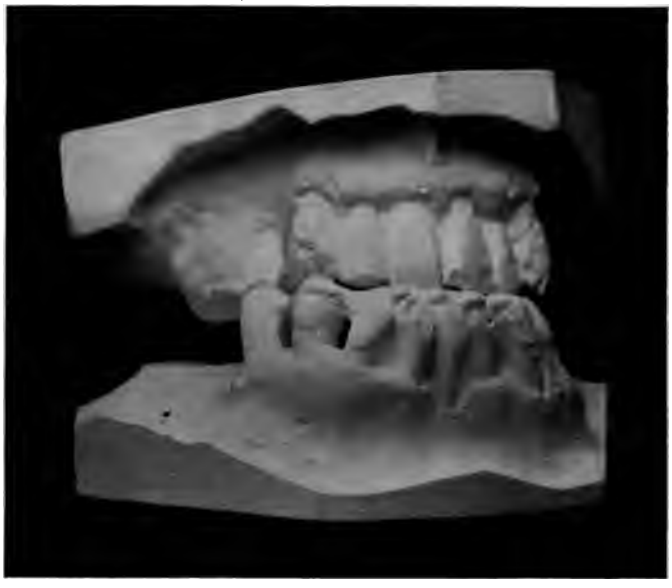
No. 4.—The upper cuspid is being driven into further mal-occlusion. The effect of this driving is to nflame the soft tissues about it and to cause the beginnings of pocket formation. This is the first tage of pyorrhea. The lower bicuspids exhibited more advanced stages of the same condition.

FAULTY OPERATIVE PROCEDURES

It may seem strange that operative procedures should be listed as a cause yorrhea, but one does not go far in the treatment of such conditions with-learning that such procedures are a most important cause. A perception he importance of proper restorations of decayed or missing teeth will help y a dentist to develop that skill and patience so essential to such restora-s. For he will see that much more than the mere restoration of a tooth been committed to him, and that, by his observation of certain points, the th of the mouth will be conserved, while, by neglect of them, conditions h more serious than those he undertook to remedy may be induced.

Attention has been called to the beautiful exhibition of mechanics which ire gives in the occlusal planes of the teeth and their inter-relations. We e also seen that by a faulty restoration of these planes a tooth is placed in -occlusion, and inflammation of the peridental membrane is induced. The hanics of the approximal surfaces of adjoining teeth are not less fine than e of the occlusal surfaces, nor is correct restoration of any lost approximal aces less important than correct restoration of lost occlusal surfaces. This be best seen from a short examination of the approximal surface of a spid or molar.

If one begins his examination of such surfaces at the gum line, he will find the surface bulging anteriorly or posteriorly as it passes toward the occlusal margin. This bulging will not be uniform in character. It will be so pronounced in certain portions of the surface that by the time the occlusal third of the tooth is reached, a distinct eminence has been formed, with curved sides which slope away from it to pass into the buccal and labial surfaces. This eminence is known as "the contact point," because it is the part of the approximal surface which rests in contact with the adjoining tooth, in the perfect denture.



ILL. No. 5.—Same case as illustrations Nos. 1 and 4. To complete the conception of the value of articulation in this connection, the rough model of this case after treatment is here shown, somewhat out of its normal relation to the text. The teeth have been put into such relation that no tooth is here subjected to excessive occlusion. They are held thus by permanent retainers which are roughly shown on the models. Photographs of the patient will be shown later.

There are few words in dental literature too strong to express the importance of this contact point to the preservation of the interdental papilla and of the tooth itself. In the perfect tooth, nature makes that contact point prominent and relatively sharp, with wide openings of the approximal surfaces to buccal and lingual of it. The approximal surfaces, apically to the contact point, separate rapidly, leaving a considerable space. This space is the home of the interdental papilla. In perfect cases, the papilla fills the space between the approximal surfaces of the teeth up to the contact point and from that point slopes away palatally and bucally in such way that food is diverted from between the teeth and thrown into the cavity of the mouth. It is the purpose of the contact point to so divide food which passes it that it shall be capable of easy diversion by the interdental papilla. When these happy conditions obtain, the soft tissues and teeth themselves remain in health with little care from the

But when this ideal arrangement is lost; when the contact point is not properly formed and the embrasures are narrow, food passing the contact point is not sufficiently divided for the interdental papilla to be able to divert it. It crowds down into the interdental space with disastrous effects.

ILL. No. 6.—Radiograph, showing loss of first lower molar and destruction of process about the second molar as a result of mal-occlusion.

When the dentist is called on to restore an approximal surface of a tooth, he cannot have too clear a conception of these functions of the contact point, and of the necessity of restoring it if the tooth is really to be preserved. He will find in the restoration of a contact point of proper form, opportunity to exemplify the highest degree of skill he may possess.

It will not, however, be sufficient to have the contact point of proper form and in proper location. The filling or crown must be of such shape as will restore the natural form of the approximal surface of the tooth, to permit the preservation of the interdental papilla. And the filling or crown should pass into the surface of the root with such perfect smoothness as will not afford the slightest irritation to the soft tissues.

Only too often such is not the case. The filling or crown may present a perfect occlusal surface and even a contact point, but the reproduction of the

ILL. No. 7.—Faulty adaptations of a cap crown to a tooth. The poorly adapted band acted as a persistent irritant to the soft tissues about the root and induced inflammation, which resulted in destruction of the process.

ILL. No. 8 shows a similar crown and an approximal filling which was never finished. The excess of filling material, crowding on the interdental papilla, caused inflammation, with resulting destruction of process. The placing of such a filling seals the death warrant of a tooth.

approximal surface may be very poor and the edge of the crown or filling may be so imperfectly adapted to the tooth as to leave a margin which is a constant source of irritation. The pyorrhea worker is early impressed with the frequency of cases in which the adaptation of the crown or filling at the cervical margin is so poor that irritation of the soft tissues results. Some such adaptations are shown in illustrations Nos. 7 and 8.

THE STUDY OF DEPOSITS

To study the causes of pyorrhea or the methods for its cure without studying the subject of Deposits, would indeed be to play Hamlet, with Hamlet left out. For pyorrhea may almost be said to begin and end with deposits. It is true, as will be shown, that the inflammation sometimes precedes the deposits, and indeed the inflammation may lead to deposits. But pyorrhea, as most dentists know it, is marked by the presence of deposits on the teeth.

These deposits differ in kind and in location. For purposes of study they may be divided into Plaques, Soft Deposits, Salivary Deposits, and Deposits found on Roots. It is worth while to devote a little time to each of these.

PLAQUES

The effect of plaques should not be overlooked. Their influence on the process of caries is now well known. Their influence on the establishment of inflammation of the soft tissues is important. They ferment and act as irritants to the gum tissues. The direct result of the action of these irritants is the beginning of inflammation.

SOFT DEPOSITS

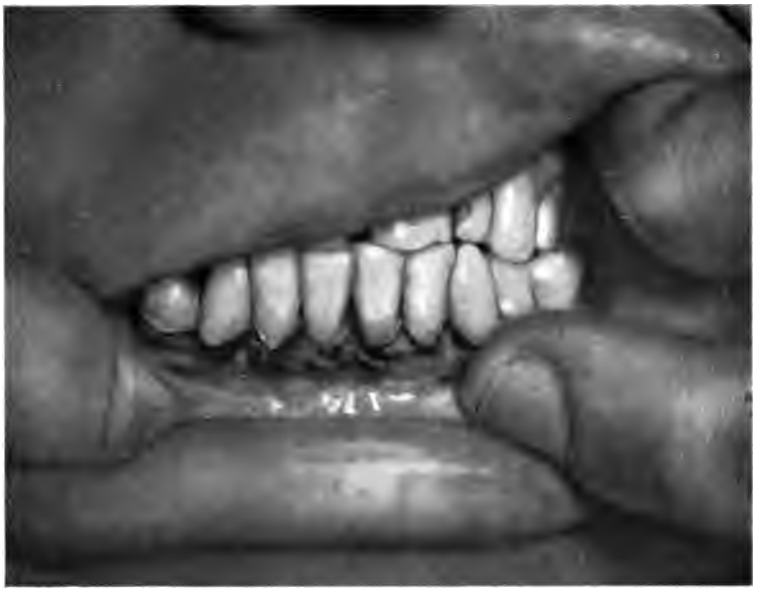
These deposits are composed of food débris. They exert two effects, one mechanical, the other chemical. The mechanical effects are those of a foriegn body exerting pressure.

It might be thought that deposits so soft in character would have little effect on tissues apparently so resistant as those of the gum. But experience proves that when even soft deposits exert a continuous pressure, the gums yield before it.

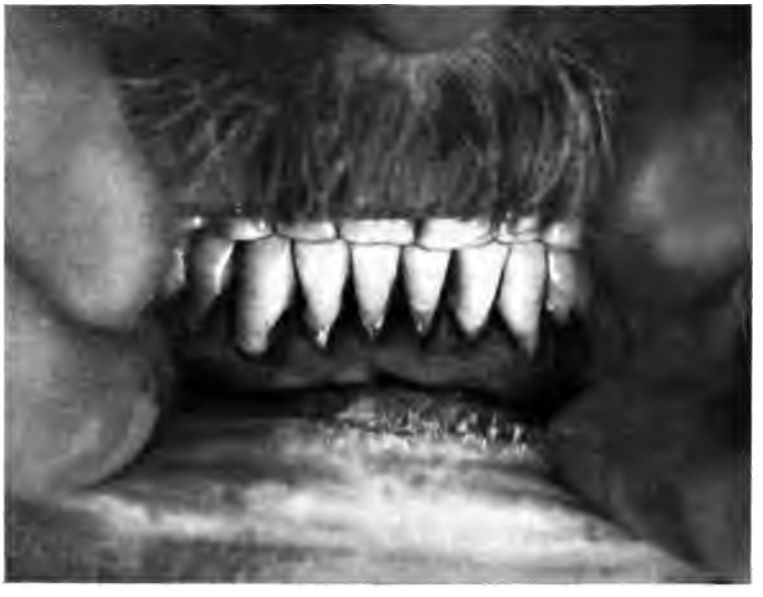
Food deposits naturally occur most frequently between teeth, preferably those that are mal-posed. They crowd on the interdental papilla which is slowly forced down from its proper and protective shape. The food is no longer diverted as it was by the papilla, and the collections increase in amount until a pocket is formed between the teeth.

The chemical influence of soft deposits results from the fermentation of these food deposits. No sooner is the food lodged than it becomes the object of attack by the micro-organisms inhabiting the mouth. Its original character is soon lost and it becomes pabulum hardly less fruitful in the feeding and production of bacteria than the agar which the scientist produces in his laboratory. All the environment is favorable for the activity of the micro-organism. The deposit affords food in plenty, the mouth is moist and warm.

This active bacterial fermentation results in the production of considerable amounts of acid. Much of this acid is formed close to the soft tissues, and doubtless exerts its effects on them before it is washed away by the influx of new saliva. While this point has not been fully worked out, it is reasonable to suppose that these acids act as chemical irritants to the soft tissues. Certain it is that between the effects of pressure from food deposits and the acids from their fermentation, the results to the gum tissues are serious. How serious these results are will be seen when we come to a study of those deposits on the roots which follow inflammation of the surrounding soft tissues.



Deposit of salivary calculus beneath the free margin of the gums with moderate amount of resulting inflammation.



Salivary deposits beneath free margin of gums with severe inflammation resulting. These are excellent illustrations of the beginning and possible extent of the inflammation resulting from salivary deposits.

SALIVARY DEPOSITS

In the minds of some dentists, all hard deposits are salivary deposits. But this is not the case. The term "salivary deposits" is properly limited to deposits thrown down from saliva. When the gums are in normal position, salivary deposits are confined to the crowns of the teeth. If they become sufficiently extensive to impinge on the gums, the gums retreat before them and the deposits may then extend to or occur on the exposed root surfaces.

The composition of salivary deposits has engaged the attention of many investigators. Their returns show slight differences but the following may be accepted as sufficiently exhaustive for our purposes:*

Calcium carbonate and phosphate	85 per cent.
Organic matter, meaning broken down epithelial cells, bacteria, mucus, food deposits, etc.	7 per cent.
Various soluble salts and water	8 per cent.

For practical purposes, salivary deposits may be divided into two kinds. One of these, yellowish in color, is deposited in large quantities at or near the opening of the ducts of the salivary glands. It is confined to that portion of the tooth projecting above the gums. In some mouths this variety forms very rapidly. It may be removed without much difficulty because, owing to the rapidity of formation, it is not so dense as the more slowly forming variety.

The second variety of salivary calculus is so different in character that it might easily be mistaken for another form of deposit. It is much darker in color, is less in quantity, and is much more dense, owing to the fact that it is deposited more slowly. This variety is found just underneath the free margin of the gums. Sometimes it entirely encircles the tooth.

The origin of these deposits may be of interest. While nothing really conclusive concerning it has been worked out, the writer believes that the slight deposits of food and other materials which can nearly always be found underneath the free margins of the gums, serve as a starting point for the deposit of the lime salts. If a prophylactic file be inserted beneath the free margin of the gum, it can usually be withdrawn pretty well filled with a soft deposit, probably composed of broken-down food material, bacteria, tissue cells, etc. This occupies the area which, unless the teeth are given prophylactic treatment, will probably be occupied by the deposit of dark salivary calculus.

THE DEPOSITS ON THE ROOTS

The deposits on the roots of the teeth differ from salivary deposits in amount, in color, and *in origin*. They may occur in small patches, or in a thin layer which may extend about a considerable portion of the root. They are never found in masses as is sometimes the case with salivary calculus.

The deposits on the root are likely to be brown in color, or reddish brown or a greenish black, the color varying with the length of time the deposits have been in place and the amount of pigment absorbed.

The origin of deposits on the roots is radically different from the origin of salivary calculus. The latter is deposited from lime present in the saliva and in food, while the former results from pathological changes in the tissues surrounding the teeth. So important is an understanding of these changes, that they will be taken up under the heading, "Pathological Changes Incident to Pyorrhea."

*Follow Gamgee's Analysis.

PATHOLOGICAL CHANGES INCIDENT TO PYORRHEA

The pathology of pyorrhea is no more difficult to understand than the pathology of any other inflammation. If one be so unfortunate as to run a nail into his foot, he recognizes the presence of an irritant and resulting inflammation. He knows that to restore the tissue to health he must remove that irritation so that the tissues may have rest and that the issues must be properly treated during the process of repair. This is precisely the case with pyorrhea. It is necessary to remove the irritants and treat the tissues properly.

In order, however, that we may better understand the pathological changes which occur during the progress of pyorrhea, and may be able to apply intelligent treatment, it will be well to study the different changes. The first paper in this series gave the following definition: "Pyorrhea is an inflammation of the tissue surrounding the teeth."

There are five well-marked characteristics of inflammation wherever it is found. There are redness, swelling, heat, pain, and altered or loss of function. These are characteristic in varying degrees of that inflammation of the oral tissues which we call pyorrhea. We can, in our line of study, do no better than follow these classical symptoms.

The reader may well be cautioned to bear in mind during the following study the fact that all inflammation traces its history back to some irritant which acted as a cause. Wherever one turns in the study of inflammation, he finds the road of causation leading back to the irritant. As all roads in Italy lead to Rome, so all study of inflammation leads one to the irritant which acted as the cause and which must be removed as the first step in intelligent treatment. The irritants producing the form of inflammation which we know as pyorrhea have been discussed under the headings, Deposits, Mal-occlusion, and Faulty Operative Procedures. It may matter little which of these is present, since the result of any is the beginning of an inflammation which, if allowed to go unchecked, follows a regular course to a destructive end.

The first recognizable symptom of inflammation of the tissues surrounding the teeth is redness of the free margins of the gums. In many cases this redness appears first at the tips of the interdental papilla.

It is very unfortunate that dentists in general do not recognize the importance of this slight redness when it first presents. It is our duty to do more than fill cavities and replace missing organs. Our greatest responsibility as well as our greatest privilege is to preserve the tissues of the mouth in a condition of health. No repairs, however skillful, are equal in value to the preservation of the maximum usefulness of the natural teeth. The dentist who observes a redness of the free margin of the gums may be sure that some irritant is at work and that the redness is nature's herald of oncoming inflammation. He can render that patient no greater service than to locate the irritant and see that it is removed before the inflammation progresses to the destructive stage.

If the first faint redness receives no attention and the irritant be not removed, the area of inflammation extends further in all directions about the point of irritation. The color changes. The first redness was due to the presence of an undue amount of arterial blood; but with the progress of the inflammation the character of the circulation in the inflamed area is altered. The blood reaching the part is not readily carried away and a purplish red color due to slowly moving blood replaces the first faint red. This purplish color may be taken as the indication of the presence of so great an inflammation as to frequently denote the destruction of the underlying bony tissues.

Another characteristic of this condition is a tendency of the gums to bleed easily. The tendency of the gums to bleed in this manner may be regarded as diagnostic of inflammatory conditions.

The second of our classical symptoms of inflammation is swelling. Of course, no such amount of swelling will be expected in the gums as would occur in parts of the body where great masses of soft tissues are present. In health the layer of soft tissues overlying the alveolar ridge is dense and comparatively thin. The first effect of an irritation is to call to the spot an abnormal amount of fluid, sent there for process of defense and repair. As the irritation continues, these fluids infiltrate the tissues and the tissue cells, which in health contain a minimum of fluid, and take up extra amounts. The result is that the tissue is materially enlarged from its normal size. This is precisely what goes on in the gum which is exposed to the continued action of an irritant.

The degree of heat experienced in pyorrhea is very small as compared with that sometimes found in other parts of the body. It is the least pronounced of all the classical symptoms.

The next classical symptom is pain. This often begins with an uneasiness which the patient refers to the teeth. Examination of the teeth often fails to reveal any cause for such a feeling by the patient, but examination of the interdental spaces and the teeth below the free margins of the gums often reveals the presence of some irritant responsible for the sensation. Upon the removal of the irritant and the proper treatment of the tooth surfaces, the sensation will often entirely disappear.

As the inflammatory process affects the peridental membrane more and more, the affected teeth become sensitive to the pressures incident to mastication and cleaning.

An attendant pain may rise from the fact that destructive changes in the peridental membrane sometimes leave the cementum exposed and sensitive.

The last classical symptom in the study of inflammation is altered or lost function. This term does not necessarily mean that the entire functioning power of an organ must be lost. Any material reduction in the functioning power of the organ is to that degree altered or lost function. This may be made plainer by reviewing the function of the peridental membrane. The great functions of this membrane are to build the alveolar wall and the cementum, to hold the tooth in position, and to act as the organ of touch for the tooth. In so far as the cells composing the peridental membrane lose the power to properly dis-

charge any of these functions, the organ may be said to have altered or lost function. Evidently this loss might be confined to the cells of part of the membrane as on one side of the tooth, while the rest of the membrane was able to fully discharge its duties. This altered or lost function by the cells is the result of some interesting processes which we will now trace.

When the functioning power of an individual cell is altered or lost, metabolism is not completed. We can compare the individual cell to a miniature chemical laboratory, in that chemical changes are continually going on within it. Under normal conditions the materials taken within the cell are split up by decomposition; portions of this material are retained by the cell and become a part of it. Waste products are thrown off and are carried away.

When the functioning powers of the cell are altered or lost, these decompositions do not take place, or at least only in part, the cell being able to absorb but not to wholly split up and use what has been brought to it. Waste products are not thrown off, but are retained within the cell and cause further degeneration of it.

Dr. Klotz has proven by experimental work upon human degenerating tissues that calcareous degeneration is preceded or accompanied by deposits of a soapy material. Furthermore, all chronically inflamed tissues have a peculiar attraction for it. It is found also that this soapy material attracts to the affected area the calcium salts which are normally present in the body fluids. The result is that the soap deposit or part of it is converted into a compound containing calcium; in other words, a calcium soap. This takes place within the cell itself.

All cells use fat in some form in carrying out their normal physiological functions; a great deal of the fat is brought to them in the form of soap. When the cell is injured the soap, which has been absorbed, remains fixed in the cell in combination with the protoplasm. The cell is overcome by the material it has attracted and the entire cell structure is broken down.

To differentiate between the bone formation and the deposits found upon the roots of teeth, it might be said that bone formed under normal conditions is not accompanied by this soapy material. Bone formation is the work of specific cells in laying down the calcium salts.

It has been found that in calcareous changes of human tissues, we have a stage of cell-degeneration, the cell substance becomes swollen; also changes within the nucleus. A stage where fat appears in the cells. Still a later stage where calcium salts appear in the cells, accompanied by the soaps.

We have a formation of insoluble soaps due to changes within the protoplasm of the cell by the liberation of albuminous matters. The calcium from the tissue fluids and blood becomes fixed by the albumen soap compound. There are present in the tissues, soaps of potassium and sodium as well as the albuminates. But reactions occur where calcium replaces the potassium and sodium and less soluble compounds are formed. The calcium salts may act directly on the neutral fat, which is present in the degenerating cell. The neutral fats are first broken down into fatty acids and these react with the calcium salts to form the soaps.

As a final result in calcareous degeneration, there is an interaction between the calcium soap albuminates and substances containing phosphoric and carbonic acids. The latter are present in considerable amounts in the lymph and blood. The acid sodium phosphates of the lymph act on the calcium soap, the insoluble calcium phosphates being formed (plus the albuminous material of the original compound), and the diffusible sodium soap is liberated, while similarly alkaline carbonates form calcium carbonate and liberate sodium and potassium soaps. The calcium phosphate and calcium carbonate become the insoluble salts. The soaps as they are liberated in the final reaction, as they diffuse out again, react with the diffusible calcium salts and form calcium soaps; so you can readily see that the reactions are continuous just so long as we have tissue which is in a degenerated state. The first irritants produce others, and in this way the chain of activities is added to, link by link

It is the writer's belief that the first deposits on the roots of the teeth are the calcified elements from destroyed peridental membrane. After pocket formation, the fluids present might add materially to the first deposit, thus increasing the amount. As these deposits collect on the root, they act as further irritants to the remaining peridental membrane.

For the sake of those who wish to take up the study of these deposits in greater detail, the following bibliography is appended:

Adami, General Pathology.
Ziegler, General Pathology.
American Text Book of Surgery.
American Text Book of Physiology.
American Text Book of Operative Dentistry.
Metschnikoff, Comparative Inflammation
Foster's Physiology.
Kirk's Physiology.
Marshall, Injuries and Surgical Diseases of the Face, Mouth, and Jaws.
Bohm, Davidoff & Huber, Histology.
Gray's Anatomy.

THE BACTERIOLOGY OF PYORRHEA

There is a famous story of a man who wrote a book on Ireland and devoted one chapter to the subject "Snakes." The text of that chapter consisted of the single sentence, "There are no snakes in Ireland." This article is somewhat like that book. For while there are numerous and virile bacteria actively engaged in breaking down the tissues bounding pus pockets, the mere mention of their names will convey with sufficient clearness the mode of their operations. There is a much more interesting and important side to their activities than the mere breaking down of their tissues. If they merely broke down the tissue immediately adjoining the pockets at the rate usual in such cases, the results would rarely be very serious, but they do more than this. To a degree rarely suspected they influence the general health of the person, sometimes making all the difference between health and serious illness or death. For this reason it will be well for us to learn what micro-organisms are usually present, what their effects are on the gum tissues, and what are their greater effects on the general health of the body.

Among the micro-organisms most actively engaged in pus production are Staphylococcus pyogenes aureus and Staphylococcus pyogenes albus, Streptococcus pyogenes and the Pneumococcus. The writer has made cultures from many pockets in the mouths of different patients. These cultures have shown the above micro-organisms to be uniformly present, either singly or in combination.

The manner of making these cultures will be of importance to any who wish to confirm these results, since there is a wide difference between making a culture from other locations in a mouth and making one from the pus of a pyorrhea pocket. The material for the writer's cultures was obtained by drying the tissues adjacent to the pus pocket, and either dipping a sterilized platinum loop into the pus or by forcing the pus out of the pocket by pressure and catching it on the sterilized platinum loop. Chance of contamination thus reduced.

To one who has observed the results of such cultures, and who has witnessed both the evil effects of the ingestion of the products of pus pockets and the good which has been wrought for patients when the system was freed from the ingestion of such poisons, it is almost incredible that the members of our profession should not be more fully awake to the possibilities of their healing art in this respect. The action of the above-mentioned organisms on the food débris collecting in the pockets and on the inflamed tissues themselves, is to produce pus in considerable quantities. Whenever the tissues are compressed in the act of mastication, portions of this pus are forced out into the cavity of the mouth and are taken into the digestive tract.

It is well recognized to-day that the health of the body is largely as its resistance to the foes which beset it. We know that the enemies of health beset us on every side. They are present in the air we breathe, in the water we drink, in the food we eat, and even in the cavities of the body through which we take in these elements of sustenance. They lie in wait for us. So long as the bodily tissues are in such health that they are unfavorable media for the propa-

gation of these germs, they can effect nothing; but when the bodily resistance has been depressed, they find a thousand ports of entrance, and under their unceasing attacks the body sickens.

No other way of lowering the resistance of the body can be more effective than to feed it those poisons which are most effective in its undoing. Among those micro-organisms effective in breaking down the tissues of the body few are more active than the pus germs. And the constant taking of this product into the digestive tract is to menace the body with dangers which it is ill-equipped to resist indefinitely.

The effects on the general health of the ingestion of these poisons and of professional blindness to the source of the trouble are well shown in the history of one of the writer's patients. He was about forty years of age, WHO GAVE A HISTORY OF good health up to within about a year of the time the writer saw him. At that time his general health began to show a breakdown which finally became so serious that he was unable to continue at his work.

When his health showed the first serious signs of failing, he consulted physicians and became a patient in one of the hospitals of good standing. Here he was treated for stomach trouble for more than six months. The treatment by the hospital was unavailing, and under it his health grew steadily worse.

Because a decayed tooth needed attention, he consulted a dentist, who told him that he had pyorrhea and treated him for it for a period of two months. Unfortunately the dentist placed his main reliance on the use of antiseptic mouth washes, which were wholly unable to reach the cause of the trouble. This treatment naturally proved unavailing. The patient had now reached a stage where he was wholly incapacitated for daily labor, a most serious situation to one who depends on his earnings for a livelihood.

Examination showed the presence of numerous pus pockets, and that he was constantly taking into the digestive tract fresh supplies of pus, unmasticated food, decomposed food remnants, and the micro-organisms always present in an unclean mouth. The change in the condition of this patient which followed proper treatment was little short of miraculous, and was sufficient to prove that the whole train of evils was the result of the pathological condition of the oral tissues. Within a month his general health was so restored that he resumed his customary occupation.

The seriousness of the situation in which that patient found himself justifies a few words on the vital importance of correct diagnosis and treatment for our patients. This man was the father of eight children. His earnings at best were small, and any inroad which they suffered quickly assumed serious proportions. When his health so far failed that he could no longer earn his small salary, life became very serious indeed for all that family.

When such cases come into our hands, and health on the one hand or ill-health on the other rests on our diagnosis and treatment, our responsibility is so great as to require us to apply with care all knowledge obtainable on the subject. While this man's case was more serious than many, there are to-day many thousands of others whose cases are progressing toward that stage, and for whom health or the reverse will lie with the dentist whom they consult.

TREATMENT

Proper treatment consists of instrumentation, medicinal and mechanical assistance, and home treatment.

The instrumentation can be accomplished with no greater labor than is expended on other dental operations, and with probably greater resulting satisfaction to both dentist and patient.

The selection of the instruments to be used in treating pyorrhea depends somewhat on the operator, but there are a few fundamental facts which must be borne in mind. The instruments for this work should be made thin, but with ample strength at those points where strength is needed. If an instrument is bulky, it is difficult to get it into a pyorrhea pocket; furthermore, bulky instruments are unnecessary. It is of the greatest importance that the angles exhibited by the instruments shall permit the operator to make use of the full width of the cutting edge on all surfaces of the tooth. Only by utilizing the full width of the cutting edge can the operator leave the surface of the root smooth and avoid cutting grooves. These angles should permit the use of the anterior teeth as a fulcrum, and still afford the operator that range of movement which will enable him to reach all parts of the tooth and remove the deposits. The advantage of being able to use the anterior teeth as a fulcrum will be evident, since it gives the operator a power and confidence he might otherwise lack, and prevents laceration of the soft tissues. The use of a reasonable number of instruments which correspond with these fundamental requirements will enable the dentist to successfully remove deposits. The writer's experience led him to make the following selection of instruments, which are satisfactory in his hands and have proven equally so to many who have become accustomed to them. The writer has succeeded in having these put on the market, accompanied by the following illustrations and directions:

No. 1 Instrument
- labial surface of upper anterior teeth, Cuts A and B, lines 1.
- lingual surface of lower anterior teeth, Cuts G and H, lines 1.

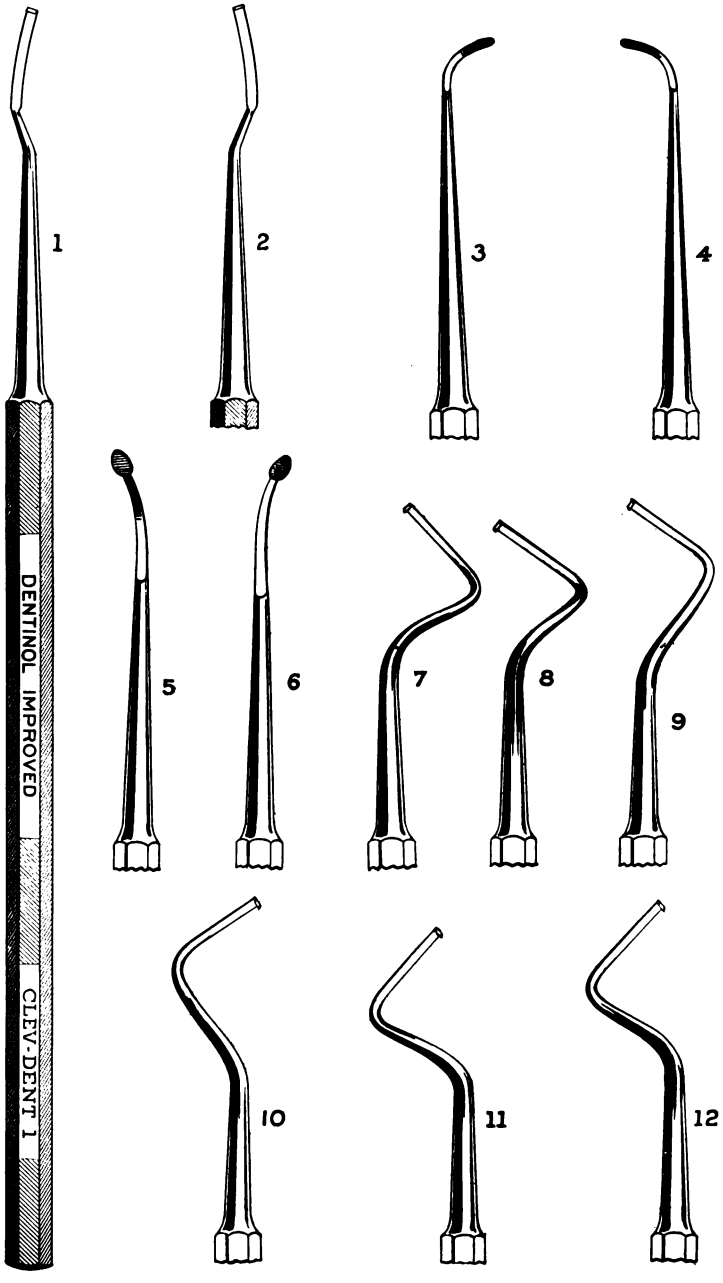
No. 2 Instrument
- lingual surface of upper anterior teeth, Cuts E and F, lines 2.
- labial surface of lower anterior teeth, Cuts C and D, lines 2.

No. 3 Instrument between roots of molars
- buccal surface of right lower molars.
- lingual surface of left lower molars.
- buccal surface of left upper molars.

No. 4 Instrument between roots of molars
- lingual surface of right lower molars.
- buccal surface of left lower molars.
- buccal surface of right upper molars.

Nos. 5 and 6 Instruments are used on all proximal surfaces.

No. 7 Instrument
- mesio-buccal surface of right upper bicuspids and molars Cut A lines 7.
- mesio-lingual surface of left upper bicuspids and molars Cut F lines 7.
- mesio-buccal surface of left lower bicuspids and molars Cut D lines 7.
- mesio-lingual surface of right lower bicuspids and molars Cut G lines 7.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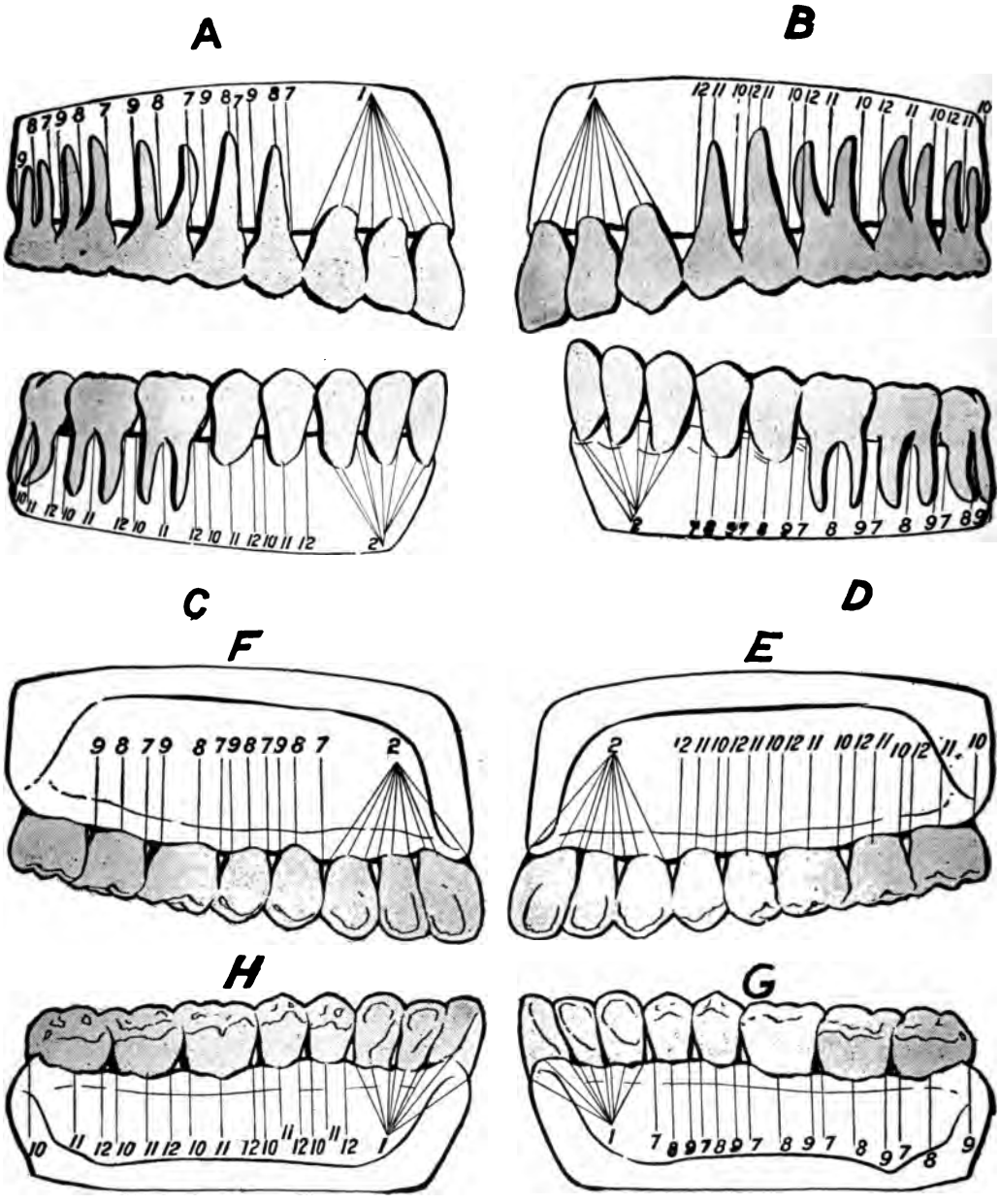


No. 8 Instrument	buccal surface of right upper bicuspids and molars Cut A lines 8. lingual surface of left upper bicuspids and molars Cut F lines 8. buccal surface of left lower bicuspids and molars Cut D lines 8. lingual surface of right lower bicuspids and molars Cut G lines 8.
No. 9 Instrument	disto-buccal surface of right upper bicuspids and molars Cut A lines 9. disto-lingual surface of left upper bicuspids and molars Cut F lines 9. disto-buccal surface of left lower bicuspids and molars Cut D lines 9. disto-lingual surface of right lower bicuspids and molars Cut G lines 9.

No. 10 Instrument

- disto-lingual surface of right upper bicuspids and molars Cut E lines 10.
- disto-buccal surface of right lower bicuspids and molars Cut C lines 10.
- disto-buccal surface of left upper bicuspids and molars Cut B lines 10.
- disto-lingual surface of left lower bicuspids and molars Cut H lines 10.

No. 11 Instrument

- lingual surface of right upper bicuspids and molars Cut E lines 11.
- buccal surface of left upper bicuspids and molars Cut B lines 11.
- buccal surface of right lower bicuspids and molars Cut C lines 11.
- lingual surface of left lower bicuspids and molars Cut H lines 11.

No. 12 Instrument

- mesio-lingual surface of right upper bicuspids and molars Cut E lines 12.
- mesio-buccal surface of left upper bicuspids and molars Cut B lines 12.
- mesio-buccal surface of right lower bicuspids and molars Cut C lines 12.
- mesio-lingual surface of left lower bicuspids and molars Cut H lines 12.

Cut G

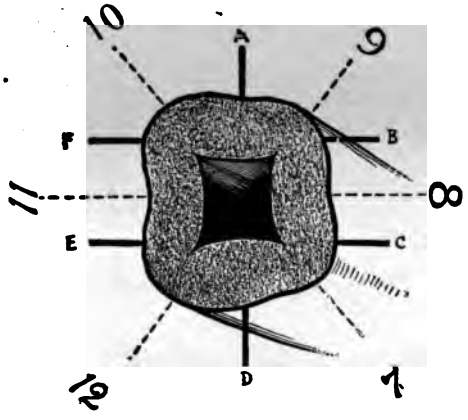
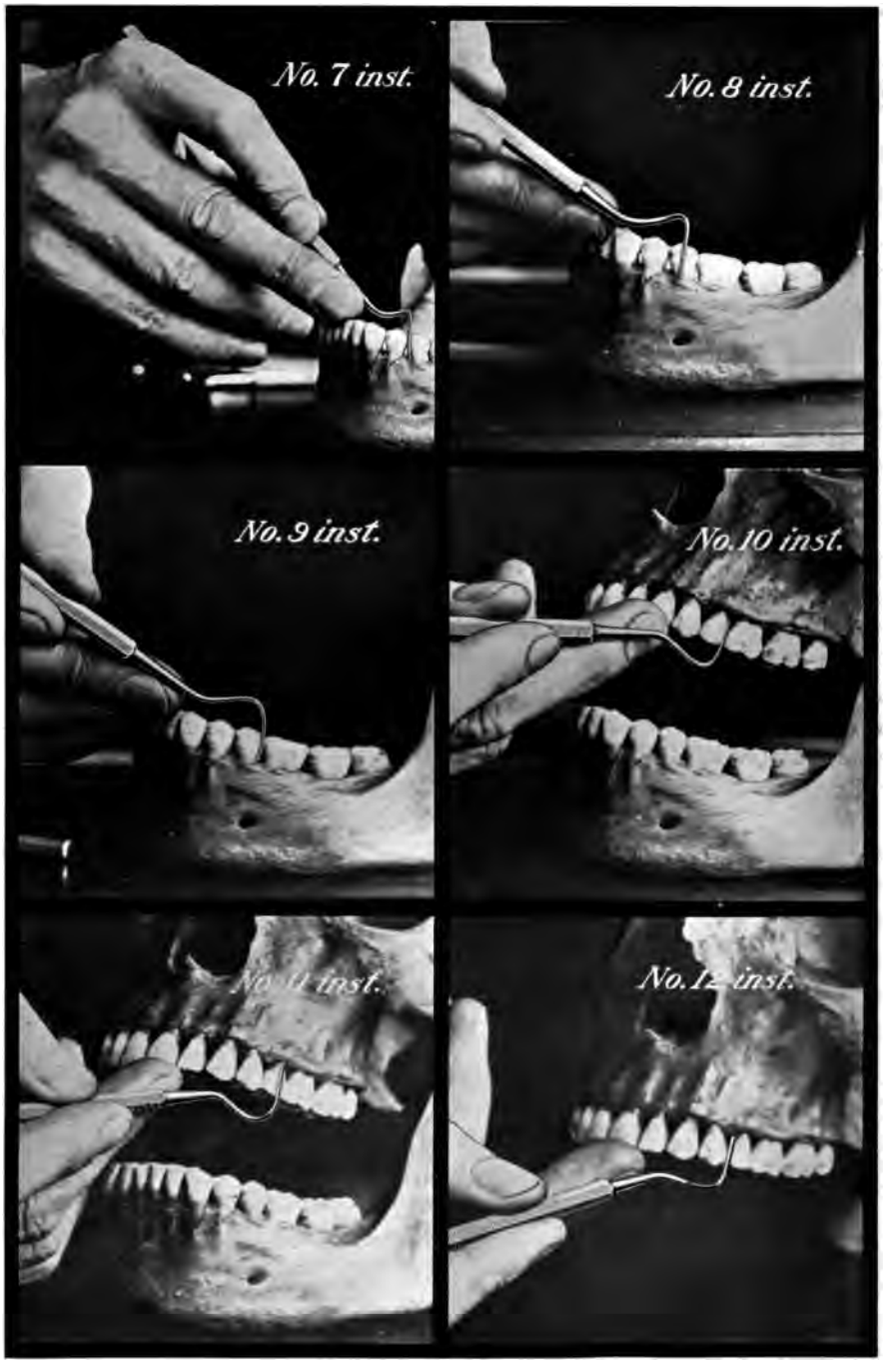


Illustration 13 shows angles of instruments Nos. 7 to 12, so arranged as to allow the operator to work completely around the circumference of the posterior teeth below the gum margin. Each instrument allows the use of anterior teeth as a rest. The fulcrum remains the same in the use of each instrument.

The question often arises in the dentist's mind as to the advisability of endeavoring to wholly relieve the inflamed condition about one tooth before treating other teeth. In general, it may be said that in cases where several teeth are affected, it is better to remove the greater part of the deposits on each of the teeth, thus giving the patient general relief more quickly. When the general condition of the mouth shows improvement, the operator may give each tooth that minute attention which successful treatment demands. This attention will be the more [illegible] use w[illegible] main, irritation of gum tissues

This illustration shows one adaptation of each instrument.
The number of each illustration corresponds with the number of the instrument used.
That is, Illustration No. 1 shows one use of Instrument No. 1, etc.



This illustration shows one adaptation of each instrument.
Illustration No. 7 shows use of instrument No. 7, etc.

During the instrumentation, the greatest care should be exercised not to lacerate the soft tissues, not only out of consideration of the patient's feelings, but because each laceration opens up new avenues of infection and retards the process of repair. The instruments should be passed alongside the root and in contact with it until the bottom of the pocket is reached. With a pull-cut movement, the deposits may be removed. During this use of the instruments, the importance of proper angles between handles and blades is made apparent. With proper angles, the blades will lie alongside the root and plane off the deposits without gouging the root or lacerating the soft tissues. With improperly angled instruments, both these unfortunate actions will be uncomfortably common.

Having secured the proper instruments, the dentist will do well to give them proper care. The first step in this care is to keep them sharp. The cutting edges should be kept sharp by frequent attention rather than neglected until no semblance of a cutting edge remains. This maintenance of sharp edges is the first requisite of humanitarian work. It also rewards the operator, by enabling him to do more and better work in a given length of time. So distinctly worth while is the maintenance of a proper edge, that the writer has long made it a habit to examine the edge with a magnifying glass and make sure that it has been sharpened with an even bevel.

Instruments may be sharpened by grasping them between the thumb and first and middle finger, much as a pen is grasped, with the bevel facing the stone. The hand may be raised or lowered till the bevel lies flat on the stone. The end of the middle finger should lie against the side of the stone, to insure evenness of motion. A passage to and fro across the stone in this position will usually sharpen an instrument which receives proper care.

The realization of the dangers to which insufficient sterilization of instruments exposes both patient and operator, should be a guarantee for the careful sterilization of each instrument just before use. To this end, boiling is absolutely essential, since mere immersion in any antiseptic solution is not sufficient to meet the requirements.

MEDICINAL ASSISTANCE

Whenever the normal equilibrium of cell activity is disturbed by irritation the cell reacts against it, producing a series of changes in the tissue. Nature possesses a power of re-establishing normal conditions provided this cell activity be not disturbed to too great an extent. As an example—the removal of salivary calculus where the inflammation has not progressed sufficiently to involve a great amount of tissue. Thus when only a little deposit is present and the irritation is slight, the cells return to a normal condition of their own accord, when the irritant has been removed.

In cases where a great amount of tissue is involved, and the inflammation has progressed, a different problem confronts us. Nature has been trying to effect repair and in so doing has used up its surplus strength or resistance, as is the case in Pyorrhea. We may aid nature in the bringing back of normal

conditions by the action of drugs suitable for the particular affection we are treating.

The drugs which are to be successful in the treatment of pyorrhea must be stimulating, germicidal and astringent.

(1) There is a general impression abroad that the physiological processes of repair may be assisted by the use of agents which are of a decidedly irritating nature. It is true that all stimulation is by irritation; that is, by waking up the active qualities in a cell which lead it to eliminate its waste products and to make proper use of those materials which the circulation brings to it. But the amount of irritation required for this purpose is generally slight and is referred to under the term "Stimulation." If that irritation be carried farther, the normal activities of the cell are disturbed and pathological activities take their place.

It is desirable that the indolent cells lining a pyorrhea pocket shall be so stimulated that they shall promptly resume their normal activities. The use of powerful irritants defeats this purpose rather than aids it. The effect of such drugs is to destroy the inflamed cells lining the pocket, to increase the area of inflammation and to retard the process of repair.

(2) It must possess germicidal qualities which shall make of the contents of the pyorrhea pocket a media unfavorable to the propagation of micro-organisms without injuring the body tissues.

(3) Its astringent property must be such that it will prevent the escape of fluids and leucocytes from the blood vessels and also hasten the absorption of those that have already escaped. A study of "Astringent Action" will convince us that we may employ agents which, when applied to tissue, produce effects that are not desirable. The three properties ought to be so combined that we do not have an excess of action on the part of any. This combination gives us the use of an effective as well as a harmless agent.

In searching for agents which would meet these requirements, the writer has made use of nearly all the remedies called to his attention. In the course of his experiments, he had tried Dentinol, and soon formed the habit of using it exclusively. The ingredients as given by the manufacturers are Cresol (refined), Oil Birch, Oil Camphor, Oil Capsicum, Oil Eucalyptus, Oil Sassafras, Oil Turpentine, Alcohol, and Ether five per cent.

When a patient presents for treatment with teeth and surrounding tissue extremely painful, an application with cotton should be made to the exposed gum tissues. Where pus pockets are present, they should be treated as well, following the methods shown later. In these cases it might be well to defer instrumentation until the following visit. One application properly made will produce a better field for operation on account of the soreness having left. Other than already stated, it is to be used after instrumentation in the following manner: First cleanse the pocket by washing out with peroxide of hydrogen or distilled water. Following this, place loose cotton rolls on both sides of the pocket, to catch any excess of the Dentinol, which, though harmless, is slightly disagreeable to some patients. This feature is overcome by care in the application. Its application is made by the use of a glass syringe which has an iridio-platinum needle with a flat point. By this means the pocket is flooded with

Dentinol. This assures it being carried to the bottom of the pocket, and repair of the tissue then starts from that point as well as near the opening of the pocket. This is very important if permanent results are to be expected. The advantage of the flat point in the application is that, if it is kept in contact with the root, pain is absent. (See Ill. No. 16.)

After the deposits have been removed from the root, the "Nursing Stage" in the treatment of the pocket commences. Treatments are continued every

ILL. No. 16.—The method of applying Dentinol.

third day until the pocket has closed. This treatment consists of cleansing of the pocket, and the use of Dentinol to aid nature in the repair of the tissues.

In cases where extensive pocket formation has taken place, a considerable amount of tissue is involved. Under normal conditions we know the bone tissue supports the soft or gum tissue. In cases where this support has been lost, the establishment of healthy conditions leads to some recession of the gum. This is due to the loss of its support and to the absorption of the fluids which were poured out into the tissue. The tissue becomes more dense and constricts about the root.

HOME TREATMENT

This phase of the treatment, coming last, is by no means the least, but is a truly important part in the maintenance of the results obtained at the chair. Too often this part is given slight consideration by the dentist, due possibly to lack of observance as to what proper cleanliness of the mouth means; not alone tooth decay, but health of the soft tissues as well. The patient must be instructed relative to the proper use of the tooth brush.

A Dentifrice must be selected with three things in view: (1) It must be a cleanser without being harmful; (2) It must render the mouth a place unfavorable to bacterial growth; (3) Its ingredients must possess the necessary

stimulating and astringent properties. Frequently these are sacrificed for materials which possess a pleasant flavor and nothing else. Such materials simply mask conditions and allow the case to gradually become worse.

The writer has prescribed the use of Pyorrhocide by the patient as a prophyactic dentifrice, and its use has been satisfactory to both dentist and patient.

The Pyorrhocide contains precipitated chalk, Peruvian, White Oak, and Elm barks, together with Dentinol, in a modified form.

The cleansing effect is brought about by the precipitated chalk (soluble in granulation) and the barks mentioned. The medicinal value is attributed to the modified Dentinol.

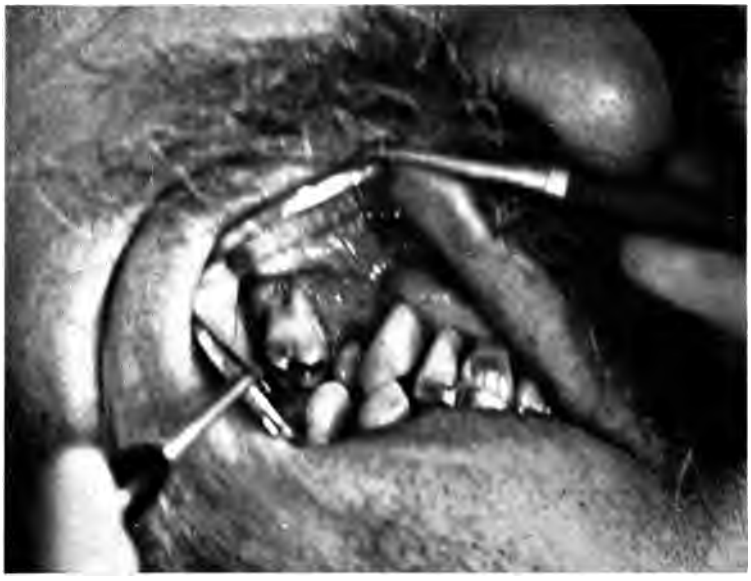
This preparation leaves a refreshed feeling in the mouth and its use by the patient easily grows into an agreeable habit.

RÉSUMÉ

Local Causes of Pyorrhea.—Mal-occlusions, Deposits, Faulty Operative Procedure.

Result of Irritation.—Inflammation, Pus-Flow.

Treatment.—Instrumentation, Home Treatment, Medicinal and Mechanical Assistance.



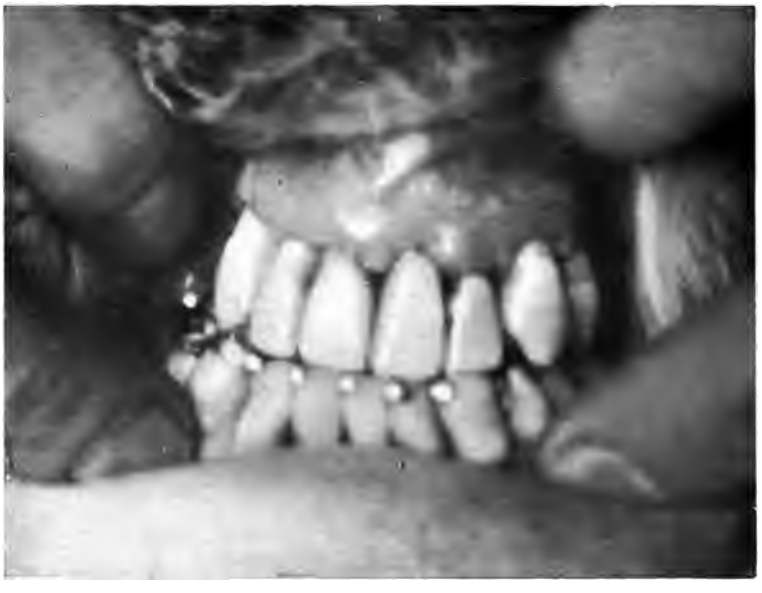
ILL. No. 25.—Pyorrheal condition on right side of upper jaw. Mal-occlusion of bicuspid and molar due to extraction. Extensive pocket formation about both teeth, with pus flow. Fistulous openings above both teeth from pericemental abscess.

ILL. No. 26.—Same case as in illustration No. 25 showing completed case. Upper teeth held rigid by a splint, a portion of which shows as inlays on the occlusal surfaces of the bicuspid and molar. Pockets treated as described in text. Gum tissue restored to healthy condition.

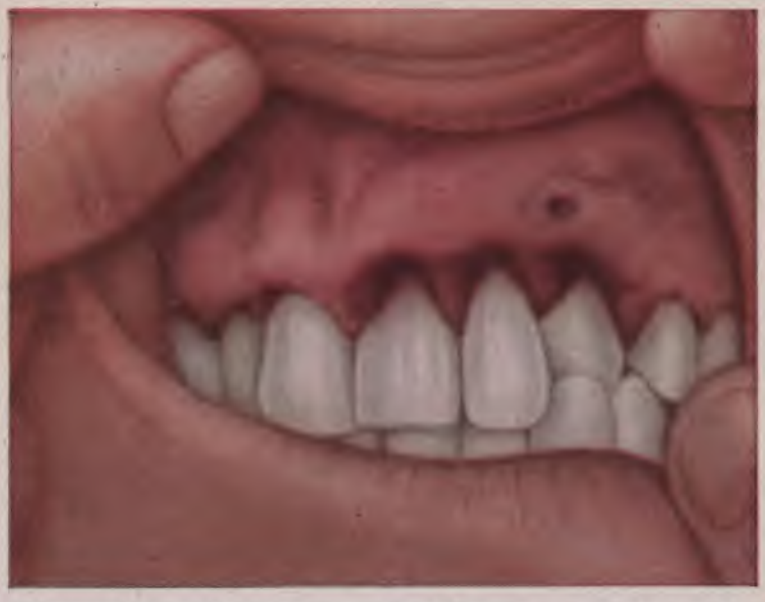
ILL. No. 27.—Anterior section of same mouth as in illustrations Nos. 25 and 26, showing part of splint which holds teeth rigid and healthy condition of gum tissues about lower anteriors.

ILL. No. 28.—Lower left side of same mouth as in illustrations Nos. 25, 26 and 27, showing part of the lower splint and completion of the occlusion, and the same healthy condition of the gum tissues.

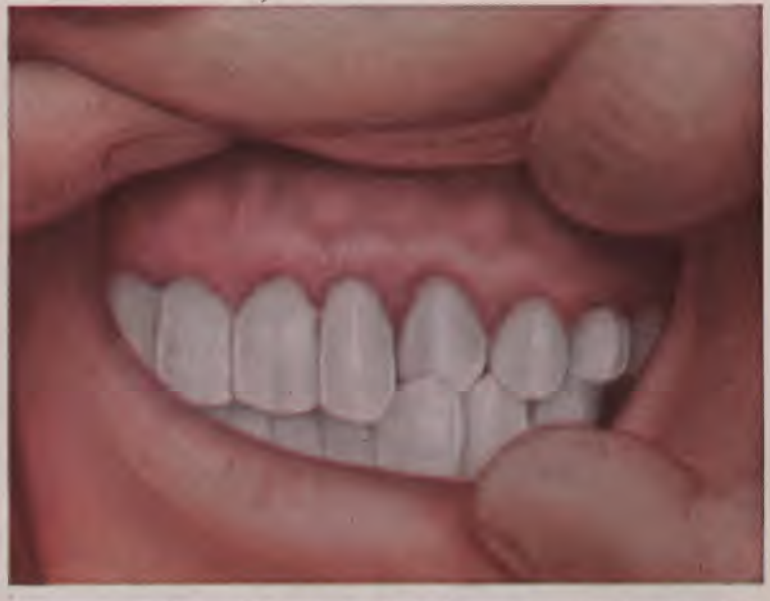
ILL. No. 29.—Anterior section of upper jaw, same case as previous illustrations taken about ten days after beginning treatment. The temporary splint was put on to hold the teeth in proper positions during treatment.



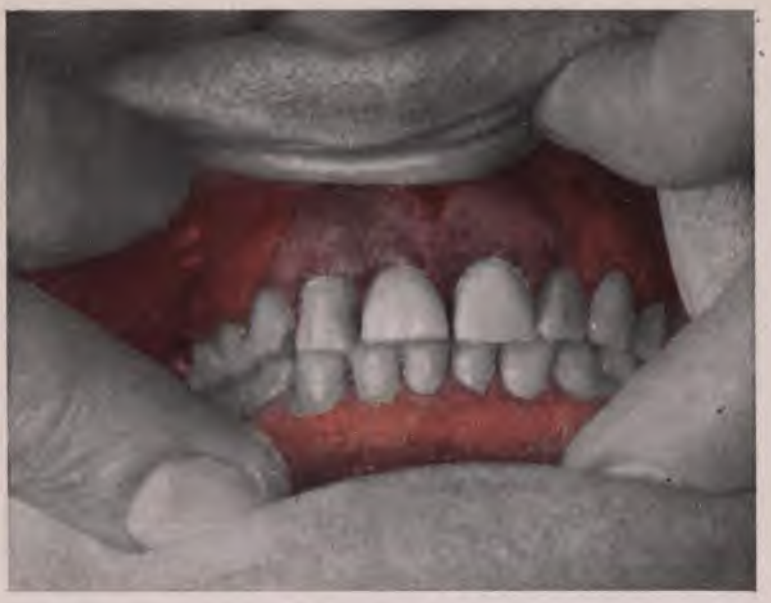
ILL. No. 30.—Same case as above. Treatment completed. The upper left central was extracted because it had no bony attachment and very slight attachment of soft tissue. The upper right central was cut off and the root used as an abutment of a bridge which forms part of a splint holding all the uppers rigid. This case required six weeks of treatment.



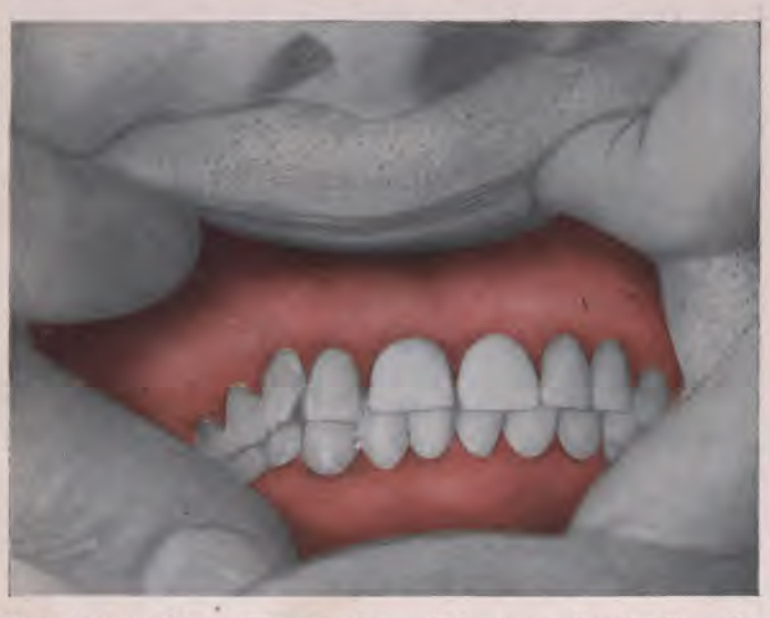
The upper left cuspid in this case suffered from excessive occlusion. Inflammation of the soft tissues about it resulted and involved the other anterior teeth.



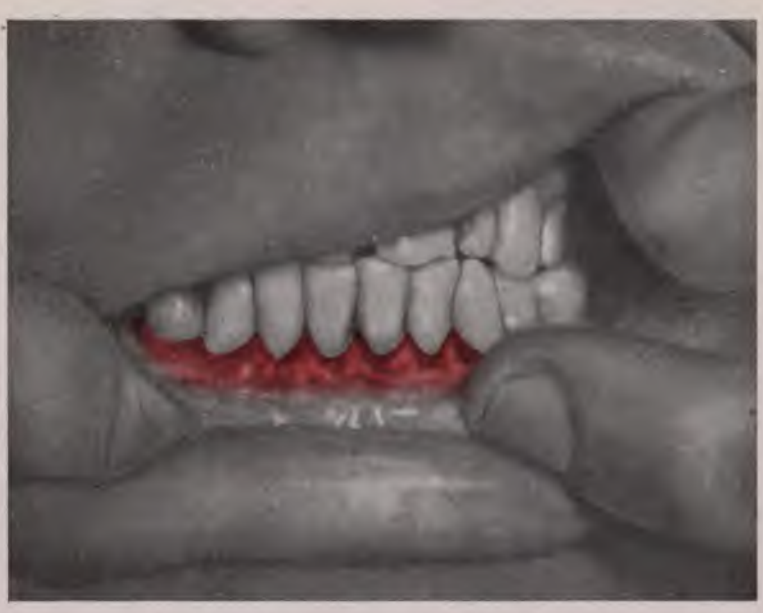
Same case as above. The excessive occlusion was temporarily relieved by grinding, and the inflammation reduced by treatment. The patient was then referred to an orthodontist for permanent correction of the malocclusion.



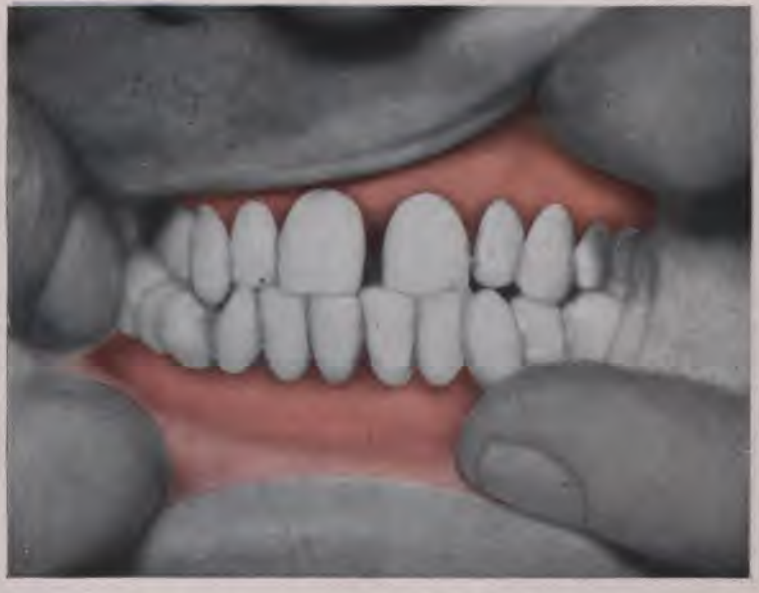
The occlusion on the porcelain crowns on the upper central roots was excessive. Inflammation of the soft tissues, with pocket formation and pus flow resulted.



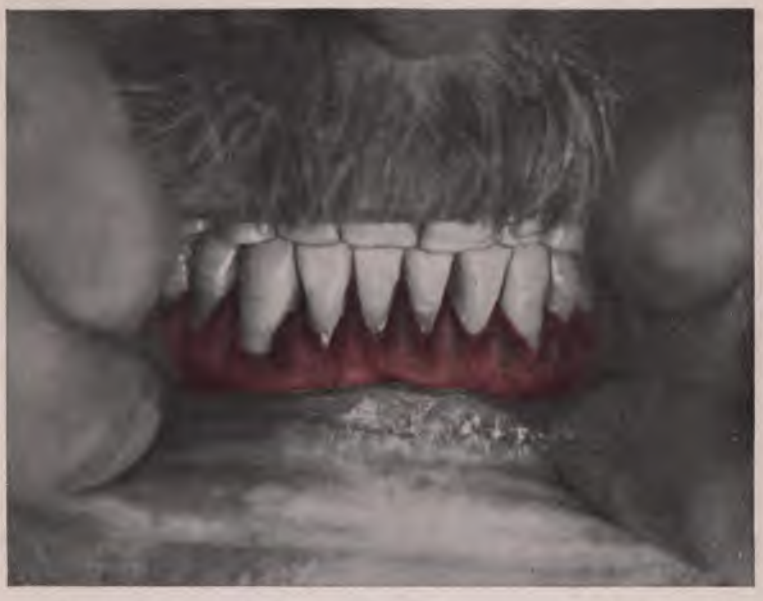
Same case as above. The excessive occlusion was relieved. The office and home treatments were as given in the text.



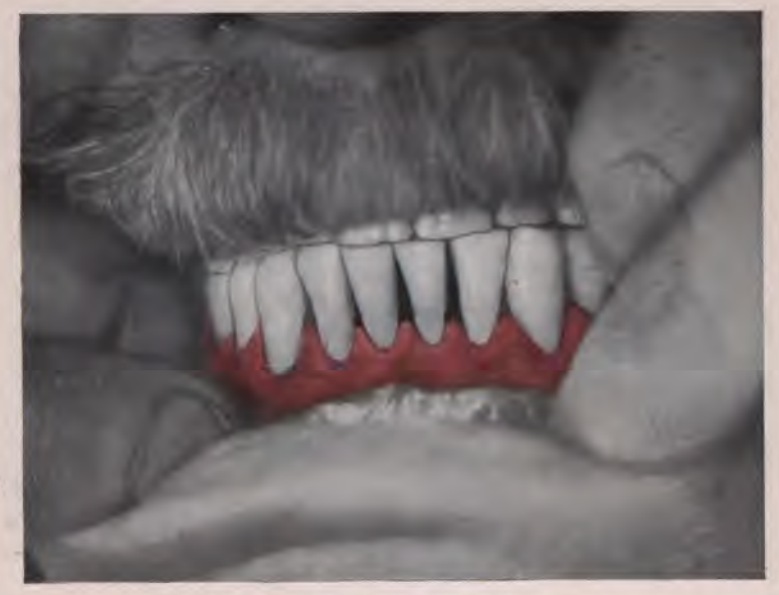
Inflammation of the soft tissues resulting from the deposit of salivary calculus beneath the free margin of the gums. This case represents a very common beginning of true pyorrhoeal conditions.



Same case as above three weeks later. The deposits were removed and proper home treatment instituted.



Extensive inflammation resulting from salivary deposits. This condition was common about 31 teeth. Teeth too sensitive to permit mastication. Pus flow in large quantities from about every tooth. Every tooth loose in its socket.

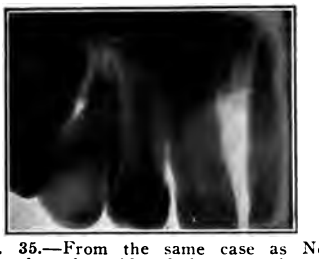


Same case five weeks later. The tissues are healthy. The soreness is gone from the teeth. Pus flow has entirely ceased. The teeth have become firm in their sockets.

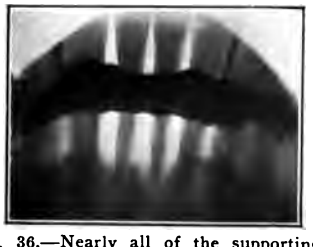
RADIOGRAPHS SHOWING DESTRUCTION OF BONE

ILL. No. 33.—The supporting bony tissue normally surrounds the tooth nearly up to the enamel line, as is here shown, between the first and second molars. The tooth is held firmly in place by the peridental membrane which is attached to the root on one side and to the supporting bony tissues on the other.

ILL. No. 34.—The dark areas indicate presence of bone. The light areas indicate absence of bony tissues. The tooth on your right is the upper left central. Two-thirds of the supporting bony tissues about this tooth and the lateral have been destroyed, permitting excessive movement of the teeth and preventing the re-establishment of healthy conditions. As part of the treatment, the teeth were held firm by a splint made of a series of bands, and healthy conditions were re-established by proper treatment.



ILL. No. 35.—From the same case as No. 34, showing the other side of the upper jaw. Central partly shown on extreme left. Lateral had been lost through pyorrhea. The splint mentioned in No. 34 extended from cuspid to cuspid. Eighteen months after finishing treatment, the tissues about these teeth are healthy.



ILL. No. 36.—Nearly all of the supporting bony tissue about the centrals has been destroyed. A temporary splint of wire was attached, the deposits removed and healthy conditions established by means of proper treatment. A permanent splint was then attached.

ILL. No. 37.—The lateral here shown was loosened by the thickening of the peridental membrane as the result of inflammation, by the loss of bony tissues, and the relaxation of the surrounding soft tissues. It became firm without the aid of a splint, through reduction of the inflammation and the contraction of the soft tissues about the root. Such cases are not uncommon.

ILL. No. 38.—Nearly complete destruction of bony tissue about the central. A temporary splint of wire was attached during treatment. A permanent splint was adapted following return of health to tissues. The tooth is firmly held by splint, and as there was only moderate recession of gum tissue, the esthetic effect is much better than would result from placing an artificial substitute.

ILL. No. 39.—Extensive destruction of bony tissues on distal surface of cuspid as result of irritation by poorly adapted crown on first bicuspid.

ILL. No. 40.—Great destruction of bone tissue about lower first bicuspid, cuspid and lateral.

ILL. No. 41.—Radiograph showing loss of first molar and destruction of process about second molar as a result of mal-occlusion.

ILL. No. 42.—All of bony tissue destroyed about the root. A slight absorption of root of central incisor will be noticed.

ILL. No. 43.—Showing loss of bone between the upper central incisors.

ILL. No 44.—Shows loss of bone between upper right central and, upper right lateral incisors.

ILL. No. 45.—The destruction of bone is nearly complete about the lower incisors. It will be noted the position of the apex of the roots of the central incisors nearly crossing each other.

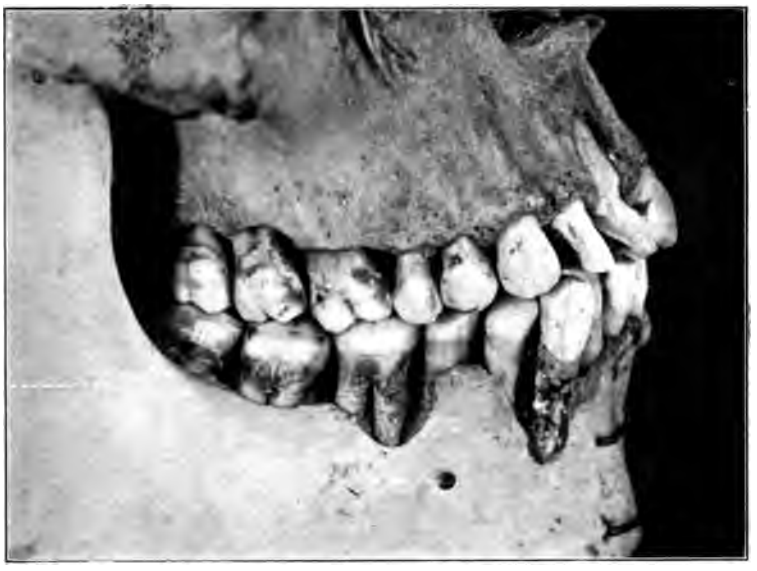
ILL. No. 46.—Two-thirds of the bone destroyed about lower left central and lateral incisors.

ILL. No. 47.—Shows loss of bone between upper cuspid and lateral. A slight loss of bone between the first molar and second bicuspid.

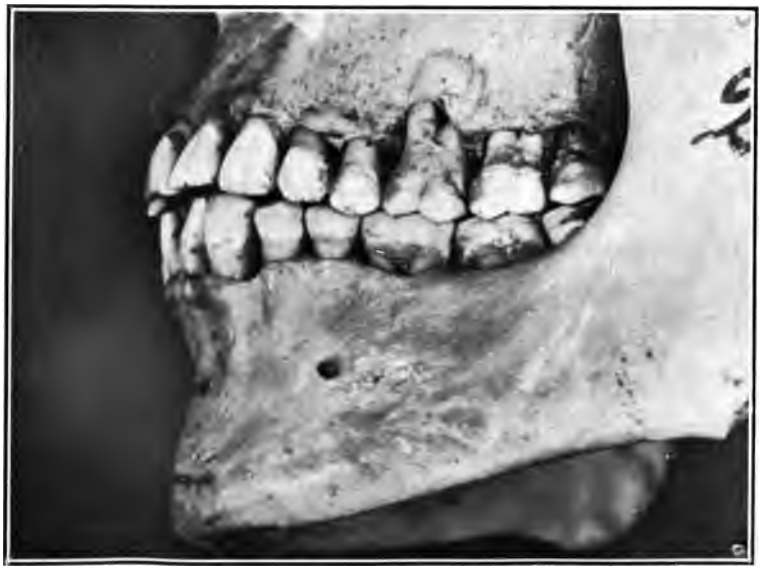
ILL. No. 48.—Nearly half of bony tissue about the lower bicuspids has been lost.

ILL. No. 49.—Two-thirds of bony tissue destroyed between the central incisors.

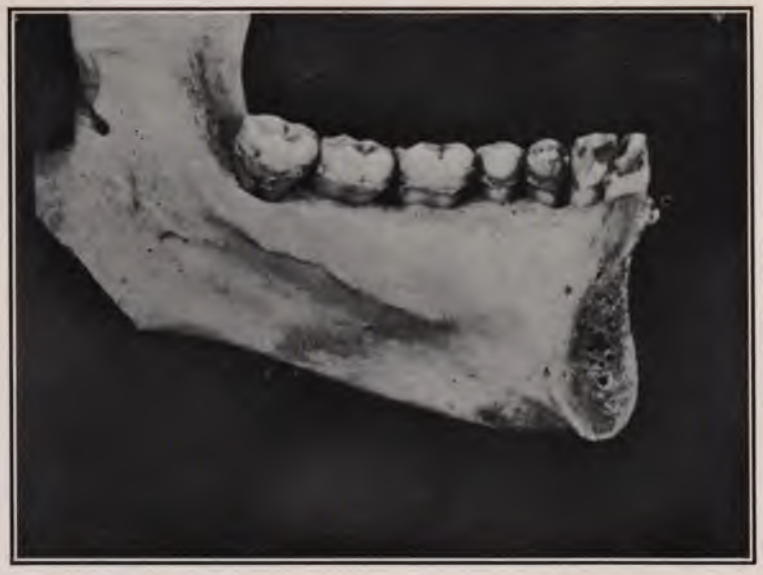
ILL. No. 50.—Shows nearly one-half of bony septum destroyed between cuspid, and lateral. The labial portion of supporting bony tissue of the cuspid was destroyed nearly to the apex of the root. Owing to the density of the tooth root it is not clearly shown in radiograph.



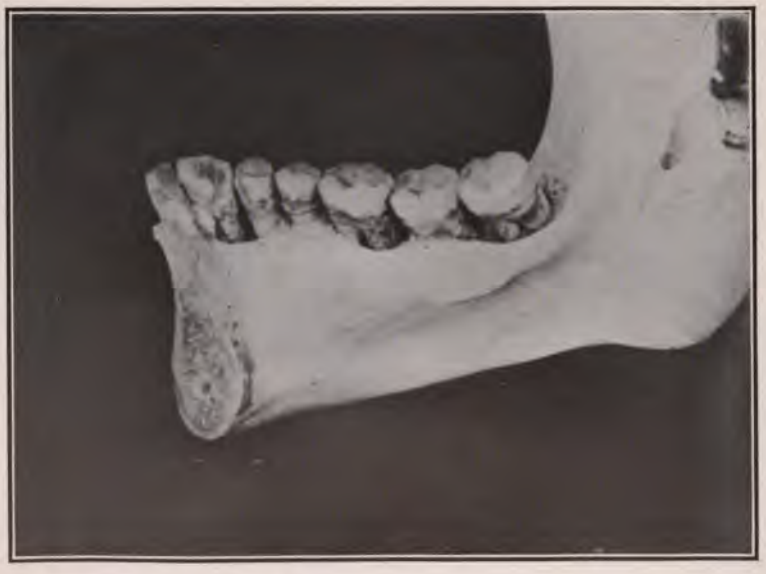
ILL. No. 51—Showing lower right cuspid and all the molars of skull, with varying amounts of deposit formation and bone destruction.



ILL. No. 52.—Same as No. 51. Deposits on all molars with destruction of bone tissues about upper molars.



ILL. No. 53.—Same as No. 51. Note deposits on lingual surfaces of all teeth with destruction of bony tissue about each tooth.



ILL. No. 54.—Same as No. 51. Other side of lower jaw shown in No. 53. More extensive deposit formation with greater loss of bony tissue.

SPLINTS

When teeth have become extremely loose as a result of pyorrhea, the u of properly designed splints is indicated. Such splints support the teeth, aff rest to the surrounding tissues, remove the constant irritation of excessive tc movement, facilitate the restoration of healthy conditions, and make the te available for mastication.

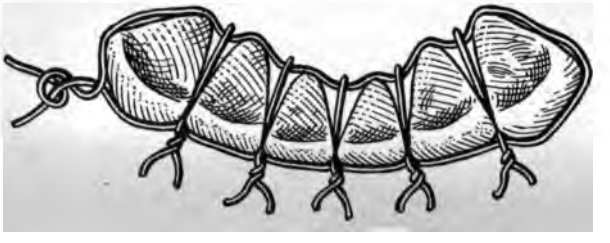
Very loose teeth may often be so splinted that they serve as satisfact abutments for bridges or as supports for partial dentures. The possibilities such splinting should always be carefully considered before loose teeth are tracted, lest it be discovered, after the teeth are out, that no other form of subs tute can be made successful and comfortable.

KINDS OF SPLINTS

Splints may be temporary or permanent. Temporary splints are th which are applied during treatment for the purpose of determining whether not the teeth will become sufficiently firm to remain healthy when unsupporte Permanent splints are employed to support teeth, which, because of extens loss of bony tissues, will never become firm enough to remain healthy if unsupported.

TEMPORARY SPLINTS

There are many ways in which a temporary splint can be made, either the use of silk or wire. Illustration No. 55 shows a form of temporary v splint which need not be changed, is clean, and if properly applied does draw the teeth together as does the silk. It is made by using 26 gauge g ligature wire for the slip-noose and 30 gauge for the wires between the te Make a slip-noose over the teeth to be enclosed, by bringing one end of the w over the other, but not twisting them together. Cut short pieces of wire be used between each two teeth, twist the ends together, and draw tight. The wires should be cut to such length that the ends may be turned back into t interproximal space without touching the gum tissues. The ends of the wi of the first slip-noose should now be twisted together. (See Ills. Nos. 55 and 56.)



ILL. No. 55.—Looking down on the w wires are placed f

ILL. No. 56.—Showing temporary wire splint made of gold ligature wire as in text and outlined in Illustration No. 55.

PERMANENT SPLINTS

Permanent splints should be adapted when the loss of bony tissues is so extensive that the teeth cannot remain firm when unsupported. Excessive motion of a tooth in its socket will induce inflammation of the surrounding tissues—and this is pyorrhea. It is essential therefore that teeth which are to remain healthy and useful shall be supported against such motion. This often requires the use of a permanent splint.

The form of the permanent splint may be determined by the conditions of the case. The following illustrations and explanations offer a few suggestions in splint procedure:

Ill. No. 57.—Section of splint made of a series of bands. Front of one band cut away. This retainer may be extended from cuspid to cuspid.

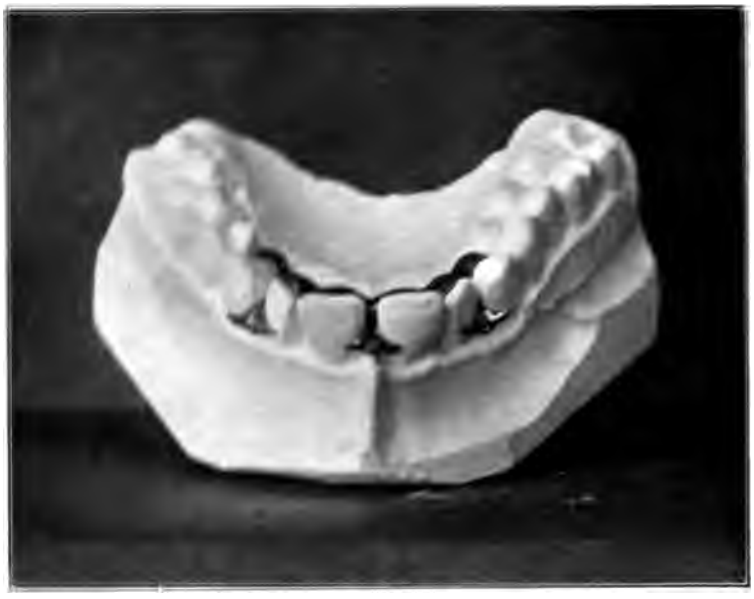
Ill. No. 58.—The lingual side of a section of splint shown in No. 57 is here shown on three teeth. Another form of retainer is shown on the other central and lateral. Pins are set into the crown of the tooth as shown in Illustration No. 59. Backings are cast or burnished as shown on these teeth. They should be then soldered together at the cutting edges, maintaining the interproximal space.

ILL. No. 59.—The lingual side of a tooth prepared for the adaptation of a backing, as shown in Illustration No. 58.

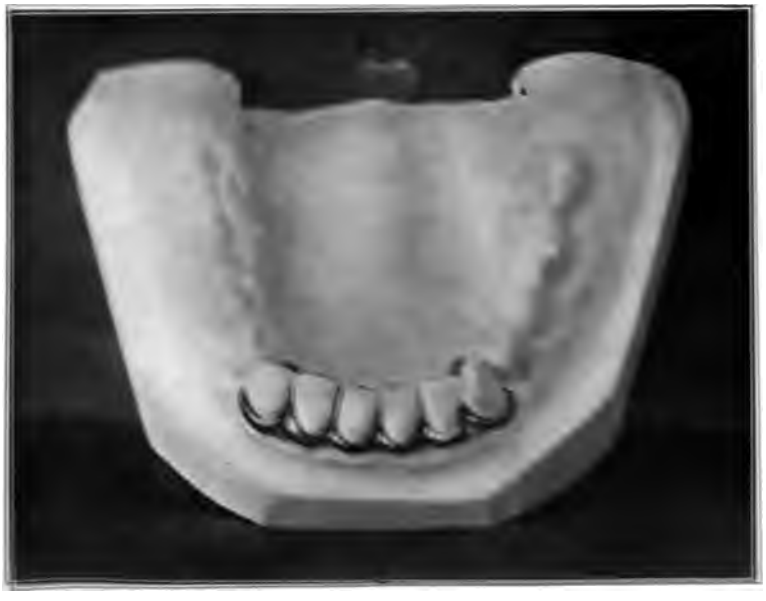
ILL. No. 60.—Cap crowns built up to re-establish proper occlusion. Crowns are then soldered together. They extend gingivally only to the bulges of the teeth.

Ill. No. 61.—Permanent splint holding four lower incisors. Attachments to cuspids may be made by devitalizing these teeth and putting posts down, or by inlays, or by putting bolts through from labial to lingual. The cast piece shown in Illustration No. 62 is put on the lingual side of the teeth and bolts put through, as shown on the incisors. Gold nuts shown unfinished on right central and lateral; the bolt hole shown on left central. Gold nut finished down in left lateral.

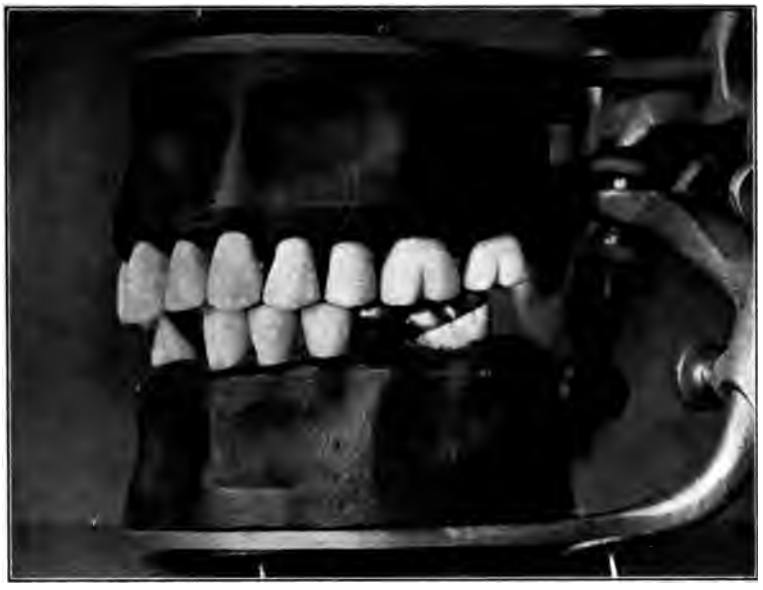
Ill. No. 62.—Lingual side of permanent splint partly shown in No. 61. This shows the cast piece on the lingual and the T heads of bolts. These bolts can be soldered to the cast piece or used as a loose bolt.



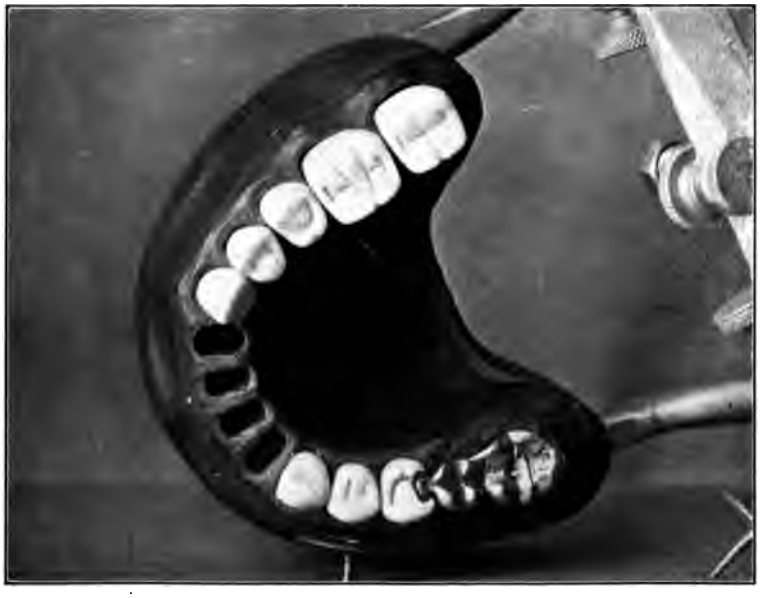
Ill. No. 63. Shows a removable splint. The lingual piece is cast. The labial pieces are cast in similar form. The arterial pieces are joined by using the bolt with gold nut. The holes in the lingual piece are threaded. Labial pieces are countersunk to take gold nut. This splint can be removed and cleaned at will.



Ill. No. 64.—Same form of removable splint as in illustration No. 63, except that the labial wire is continuous. The bolts uniting the pieces pass between the incisors and cuspid on each side. This splint can be removed and cleaned.



Ill. No. 65.—Occlusion and articulation restored by means of a crown or inaly on lower second molar and a dummy in place of the first molar. This prevents elongation of the upper teeth and tipping of the lower, and gives the tissues supporting these teeth their normal amount of work. The occlusal view of the piece and the form of attachment to the bicuspid are shown in Illustration No. 66.



Ill. No. 66.—Occlusal view of piece shown in Illustration No. 65. An inlay was made to fit the bicuspid. A cavity is formed in the inlay, either to be retentive in form to receive a similarly shaped lug from the dummy, or merely to afford rest for such a lug. The use of the second inlay in the tooth is to permit good adaptation and avoid caries.

THE BUSINESS SIDE OF PYORRHEA PRACTICE

The dentist who properly develops the business side of pyorrhea practice will enhance his reputation, enlarge his clientele, elevate his procedure, and increase his income.

It cannot be expected that the public who are unacquainted with the possibilities of pyorrhea treatment will be enthusiastic on the subject until their knowledge of the benefits to be received has been increased. But any patient of ordinary intelligence may be educated to the necessity for pyorrhea treatment (when such necessity exists in even an initial stage) and can be made enthusiastic as the work progresses.

This education of the patient should consist of an explanation in the plainest and simplest terms of what causes the symptoms as manifested, at the same time showing these manifestations by the aid of a mirror, and an outline of the progress of the disease if left unchecked. This subject affords opportunities for some of the most convincing and educational talk which it falls within the province of the dentist to give. During such talks the illustrations in this book will be found very helpful.

If the manifestations of the disease are serious, a plain talk should be given on the conditions of the mouth, the formation of pus and other poisons; their effect on the general health; the results of neglect on the teeth and jaws, including the effect on the looks; the failure of the bodily powers following the loss of masticating powers; and the undesirability of dentures as compared with the natural teeth.

Time spent in presenting these conditions to patients in need of pyorrhea treatment will be found, in the end, to be well invested. Fifteen minutes spent thus will often times either secure the work immediately or so interest the patient as to end with the work being done. Not every patient can be interested, but the time given to these talks may be regarded as very well spent, for the number of appreciative patients will be steadily increased.

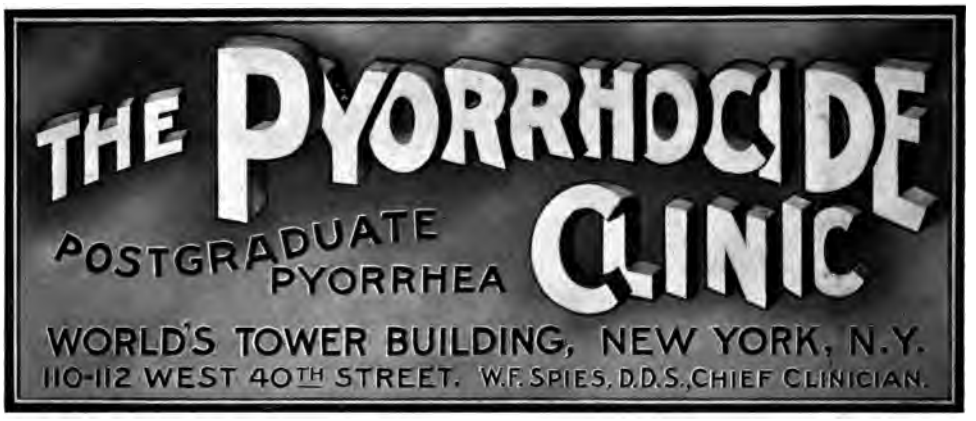
The measure of success in pyorrhea treatment will be greatly increased by winning the patient's enthusiastic co-operation. This is not difficult if certain simple methods are followed. In serious cases it will often come of itself as result of the physical improvement which is soon apparent.

If, however, each visit of the patient be used as an opportunity for educational talk on the teeth, their value in health, and the injurious effects of deposits and decomposition of food, a gradually increasing conception of the value of the teeth and surrounding tissues will be formed in the patient's mind, and co-operation to make the most of them will naturally result. Such information can be given in plain words as a matter of conversation during treatment.

A most effective way of securing enthusiastic co-operation is to select an area in the front of the mouth, where the ravages of pyorrhea are apparent, and by treatment exhibit in that area the benefits of what is being done. This will be such visible proof that few patients can resist the inspiration to add their efforts to yours.

As soon as the number of patients justifies, it will be found advantageous to set aside certain times exclusively for the treatment of pyorrhea. This permits adequate preparation, prevents confusion, and facilitates treatment.

Ill. No. 67.—Profile view of case of pyorrhea presenting at the Pyorrhocide Post Graduate Pyorrhea Clinic. The tissues surrounding every tooth were involved. Extensive pocket formation and copious flow of pus. The thickened condition of the tissues is shown also in Illustrations Nos. 69, 70, 71.



The writer has established in New York City a clinic for the treatment of pyorrhea and the teaching of the methods outlined in this book. This is the culmination of several years of study and practice along these lines.

The writer had long been engaged in the study and treatment of pyorrhea, when, in 1907, he was induced to try Dentinol and Pyorrhocide. His success with it was greater than with any previous form of treatment. With improved methods, the benefits to patients became more pronounced and uniform. The successes attained induced The Dentinol and Pyorrhocide Company to arrange for free pyorrhea clinics in different parts of the country, in order that members of the profession might be taught the possibilities of this method of treatment.

The interest attending these clinics led many dentists to express the wish for a permanent, properly equipped Clinic to which they could go for practical instruction in both methods and theory.

The writer has therefore opened, at 110-112 West 40th Street, New York City, The Pyorrhocide Post Graduate Pyorrhea Clinic for the treatment of pyorrhea. By an arrangement with The Dentinol & Pyorrhocide Company, the scope of the work has been enlarged to afford members of the dental profession practical and theoretical instruction in the treatment of pyorrhea, entirely without cost to them.

POST GRADUATE COURSE

The principal activities of the clinic face toward the members of the dental profession. Any member of the dental profession may without charge visit the clinic as often as he wishes and observe the methods employed. He may bring his own patient for treatment at appointed hours, and perform the treatment under the author's direction, entirely without charge.

In other words, the great principle of the clinic is to afford to members of the dental profession an opportunity to obtain a practical working education in prophylaxis under the most favorable conditions and without the payment of fees.

METHODS OF INSTRUCTION

Instruction is both theoretical and practical. The two phases of work go hand in hand.

The theoretical part of the instruction is embraced in a series of illustrated lectures which deal with subjects on which more than mere practical knowledge is necessary. A few such subjects are:

The Causes and First Manifestations of Pyorrhea.

Successful Methods of Treatment.

Instruments: Their Purposes and Application.

The Necessity for Medicinal Aid.

Splints: Their Forms and Construction.

Home Treatment by the Patient.

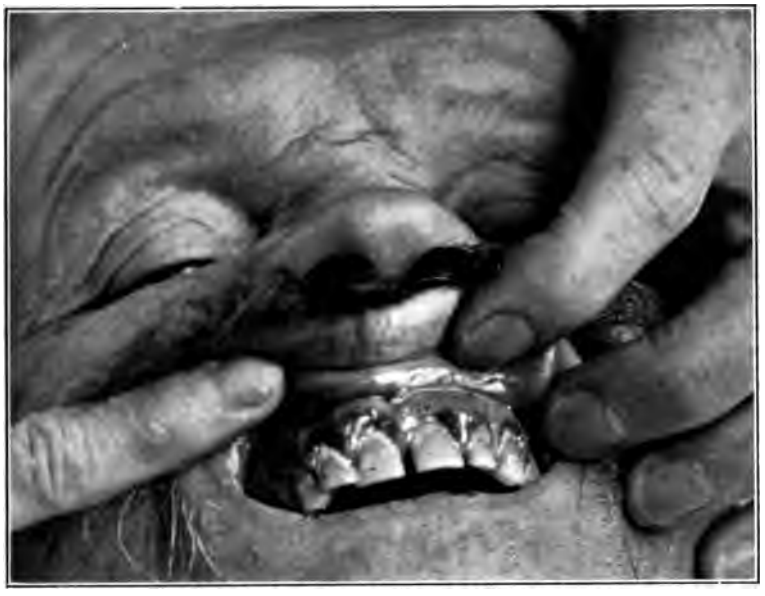
The Business Side of Pyorrhea Practice.

That portion of the instruction which is often referred to as "the practical part" is practical indeed. For the dentist who wishes, arrangements will be made for the actual treatment of cases under the author's supervision and such treatments may be continued for as long a period as the visiting dentist desires. The dentist may bring his own patient, or a patient will be furnished. Both forms of instruction are open to all members of the dental profession entirely without charge.

For the benefit of dentists who are unable to attend the clinic but desire aid in the conduct of pyorrhea treatment, a Correspondence Department has been arranged. Such dentists may receive, on request, a chart on which are printed questions covering practically every condition likely to be present. By answering these questions and returning the chart to the Pyorrhocide Clinic, he may receive, free of charge, advice concerning the treatment of the case. This will often prove very helpful to the dentist, particularly to him who is without experience in the treatment of pyorrhea.

Ill. No. 69.—Same case as is shown in profile in Illustration No. 67. The hypertrophied condition of the tissues in this area is clearly shown.

Ill. No. 70.—The hypertrophied condition of the interdental papillæ evidences the amount of inflammation in the tissues. The teeth were very loose, there was extensive pocket formation and copious flow of pus.



ILL. No. 71.—The upper anteriors were very loose, the right central being especially so. Pockets extended nearly to the apices of the teeth, showing extensive loss of supporting bony tissues; copious flow of pus.

ILL. No. 72.—An unusual case presenting at the Clinic for treatment.

ILL. No. 73.—One of the numerous temporary Free Pyorrhea Clinics which have been given in various cities throughout the United States.

FREE PYORRHEA CLINICS

So great was the interest aroused in the minds of those dentists who first knew of the results obtained in the clinical treatment of pyorrhea by the methods here outlined, that it was felt that the information so gathered should be given to the whole dental profession. The difficulties of imparting this information were overcome by the establishment of a free clinic in New York at which were demonstrated both the methods of treatment and the results obtained. So great was the success of this first clinic that demands for similar clinics came from many quarters, and temporary clinics have been held in the cities of

Albany, N. Y.	**Portland, Ore.**
St. Louis, Mo.	**San Francisco, Cal.**
Denver, Col.	**Cleveland, O.**
New York City, N. Y.	**Seattle, Wash.**
Philadelphia, Pa.	**Buffalo, N. Y.**
New Orleans, La.	**Providence, R. I.**
Los Angeles, Cal.	**Chicago, Ill.**

This novel and practical form of imparting information on a subject which long been the theme of mere theoretical discussion, has been the means a widespread interest in the treatment of pyorrhea. Hundreds of o were skeptical as to the possibility of successful treatment are now heir own successes. Similar successes are open to any dentist who ns to follow the suggestions outlined in this boo

Illustration of the ninety-seven test tubes containing the materials used in part of the experiments here described. The results of these tests were shown at the meeting of The National Dental Association, held at Denver, Col., July 19th to 22d, 1910. The tests were conducted by William C. Mitchell, M.D., Bacteriologist, Denver, Col.

BACTERIOLOGICAL INVESTIGATIONS TO DETERMINE THE ANTISEPTIC AND GERMICIDAL PROPERTIES OF DENTINOL

While the conditions under which bacteria grow in the mouth and the conditions under which their growth must be combated differ somewhat from the conditions of a laboratory experiment, much may be learned as to the efficiency of any given form of treatment by experiments which show its effect on pure, virile cultures of the more resistant pathogenic germs, under laboratory conditions.

To demonstrate the antiseptic properties of Dentinol, a series of exacting experiments were carried out according to the most approved bacteriological methods. Dilutions of Dentinol were made by adding to it different amounts of nutrient bouillon, a substance in which bacteria grow well, according to the following table:

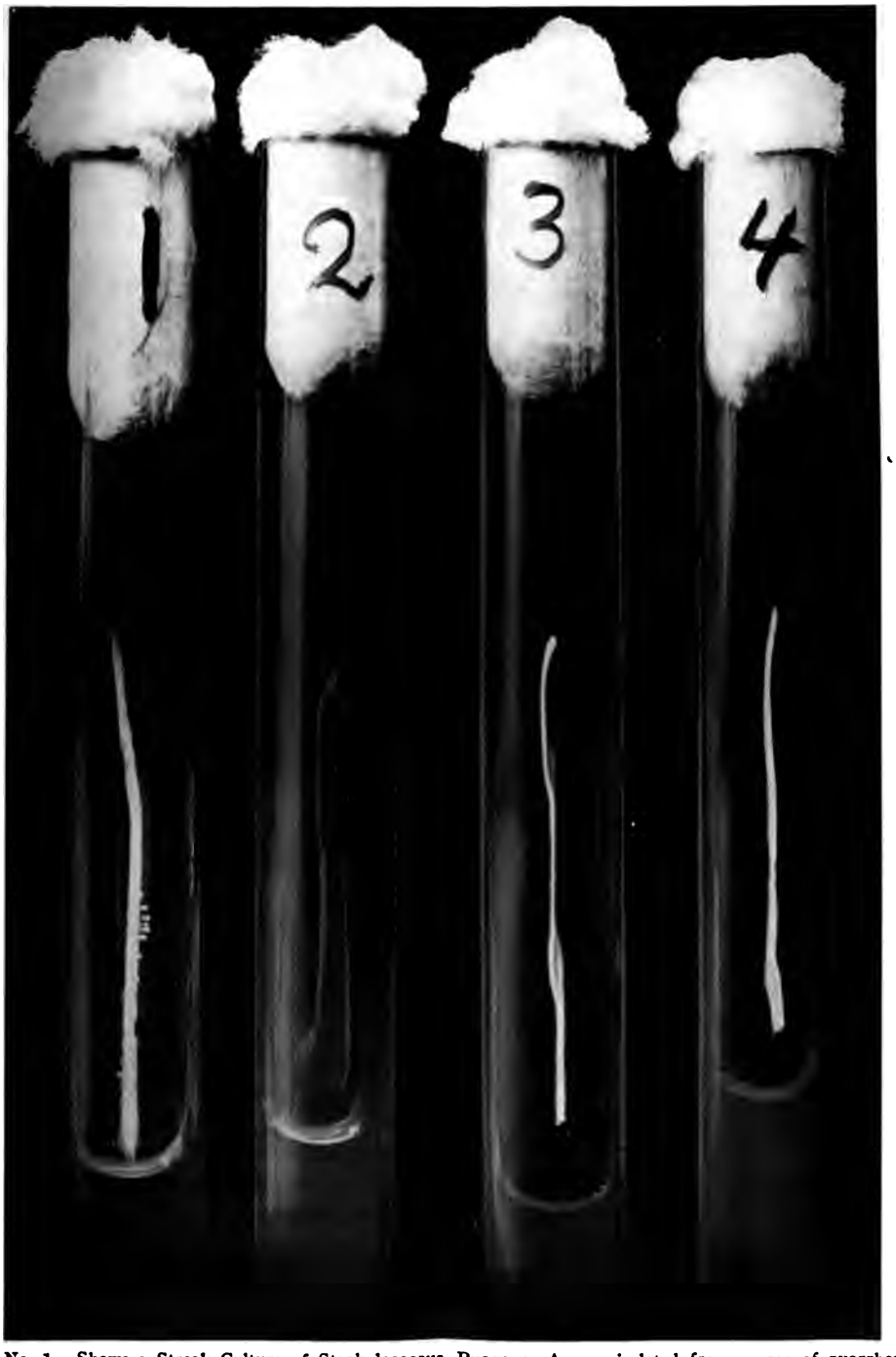
1 to 10 dilution—Dentinol, 1 c.c.; sterilized nutrient bouillon, 9 c.c.
1 to 25 dilution—Dentinol, ½ c.c.; sterilized nutrient bouillon, 12 c.c.
1 to 50 dilution—Dentinol, ¼ c.c.; sterilized nutrient bouillon, 12¼ c.c.

To make higher dilutions, a 1 to 10 dilution of Dentinol was made by adding 9 parts of Normal Salt Solution to one part of Dentinol. This dilution was then added to nutrient bouillon in the following proportions:
1 to 100 dilution—Dentinol in Normal Salt, 1 c.c.; nutrient bouillon, 9 c.c.
1 to 200 dilution—Dentinol in Normal Salt, ½ c.c.; nutrient bouillon, 9½ c.c.
1 to 400 dilution—Dentinol in Normal Salt, ¼ c.c.; nutrient bouillon, 9¾ c.c.

Pure cultures of the most resistant of the pathogenic organisms common to the mouth were made especially for these experiments. They included Bacillus Typhosus (Typhoid), Bacillus Diphtheria, Streptococcus Pyogenes, and Staphlococcus Pyogenes Aureus.

From these pure cultures the tubes containing the several dilutions of Dentinol were inoculated. This was done by dipping a sterile platinum loop into a pure culture and plunging it into the dilution of Dentinol. This was done three times for each inoculation. These tubes were kept at a temperature of 37° Centigrade for a period of twelve days. At intervals of twenty-four hours material from each tube was transplanted to tubes containing blood serum, which were also kept at a temperature of 37°. The purpose of these sub-cultures, as they are called, was to give any bacteria which had survived their exposure to Dentinol in any of its dilutions an opportunity to manifest their presence by growth on this medium which contained no Dentinol. Thus, if a sub-culture was made from a tube containing a 1 to 400 dilution of Dentinol, any bacteria which had not been killed by the Dentinol would grow on the blood serum. Absence of growth on the blood serum was accepted as conclusive evidence that no bacteria had survived the exposure to Dentinol. In all cases where there was doubt as to whether or not there was a growth, the sub-culture was examined under a microscope.

The illustration below is a detail of a bacteriological experiment.



No. 1.—Shows a Streak Culture of Staphylococcus Pyogenes Aureus isolated from a case of pyorrhea.
No. 2.—Streak of Culture of Streptococcus isolated from the throat.
No. 3.—Streak Culture of Bacillus Diphtheria isolated from a case of diphtheria.
No. 4.—Streak Culture of Bacillus Typhosus isolated from stools of patient.

To insure the proper checks on the correctness of each step of the procedure, controls were made as below:

Sterilized Nutrient Bouillon.
Sterilized Nutrient Bouillon with Dentinol.
Normal Salt Solution.
Löffler's Blood Serum.
Bacillus Typhosus and Sterilized Nutrient Bouillon.
Bacillus Diphtheria and Sterilized Nutrient Bouillon.
Streptococcus Pyogenes and Sterilized Nutrient Bouillon.
Staphylococcus Pyogenes Aureus and Sterilized Nutrient Bouillon.

The results of these tests are given in the table below, and explained in the paragraph following:

Dilutions of Dentinol	1:10	1:25	1:50	1:100	1:200	1:400
Bacillus typhosus	—	—	—	—	—	+
Streptococcus	—	—	—	—	—	—
Staphylococcus (aureus)	—		—	+	+	+
Bacillus diphtheria	—	—	—	—	—	—

+ Shows growth. — Shows no growth.

It can be seen from the above table that in all dilutions up to 1 to 100 Dentinol prevented all growth, even in the case of the highly resistant pus producing Staphylococcus Pyogenes Aureus. In the dilution 1 to 100 the growth of this organism was markedly inhibited. None of the other bacteria showed growth in any dilution up to 1 to 400. In the dilution 1 to 400, the Bacillus Typhosus showed slight growth.

The importance of these tests and their testimony to the efficiency of Dentinol as an antiseptic and germicide can be fully appreciated only when it is borne in mind that Dentinol is always used in full strength in the treatment of pyorrhea. It is thus 100 times as effective in practical use as in that dilution which permitted the first slight growth of the pus-producing Staphylococcus, and 400 times as effective as the dilution which permitted the first faint growth of the Bacillus Typhoid.

To the dentist who is confronted with the practical questions arising in the treatment of pyorrhea, the confirmation of these laboratory experiments by extensive clinical experience may be of greater interest. Thorough clinical tests have therefore been conducted in such ways as to produce results of practical value.

These tests consisted of: First, determining what organism or organisms were present in the pyorrhea pockets. Second, to determine, by treatment under conditions which are met with in every-day practice, the effect of Dentinol on the organisms and tissues.

The manner of making these cultures is very important, since there is a great difference between making a culture from other locations in the mouth and one from the pus of a pyorrhea pocket. The material for the cultures was obtained by carefully drying the teeth and tissues adjacent to the pyorrhea

pocket from which pus was exuding. Either a straight or looped platinum wire thoroughly sterilized was inserted into the pocket, or the pus was forced from the pocket or fistulous opening by pressure and taken up on the wire. By doing this carefully, chances for contamination are greatly reduced.

The pus upon the platinum wire was transferred to a culture tube containing a media of blood serum. Here the bacteria were allowed to colonize. From the single colony pure cultures were worked out and transplanted to tubes containing Agar-Agar. Many such observations show the pus-organisms, Staphylococcus Aureus and Streptococcus, to be uniformly present either singly or in combination.

To show the practical antiseptic value of Dentinol, cultures were made from pus-producing pyorrhea pockets. These pockets were then treated with Dentinol. It was uniformly found that after from three to ten treatments pus was no longer present, showing conclusively that the pus organisms had been destroyed by proper treatment with Dentinol.

CHARACTERISTICS OF DENTINOL AND PYORRHOCIDE

Dentinol is a liquid to be applied by the dentist. Pyorrhocide is a powder containing Dentinol, in a modified form, together with White Oak, Elm, and Peruvian barks, with precipitated chalk in soluble granulation as a base and is for home use by the patient.

The dentist who wishes to successfully treat pyorrhea is naturally interested in the clinical record of preparations which are in such universal use.

This clinical history may be summed up by saying that for thousands of dentists these preparations have made pyorrhea treatment successful for the first time. For others who were successful, Dentinol and Pyorrhocide have reduced treatment to a rational and greatly simplified basis.

While it might be instructive to examine the laboratory researches which have resulted in such successful formulas, an explanation of the basis of the clinical success of the preparation will be most valuable to the dentist who wishes to get to the heart of the matter quickly.

The proper function of medicinal assistance in the treatment of pyorrhea is the restoring of tone in diseased tissues, following proper instrumentation. This healthy condition is produced by the exercise of the germicidal, astringent and stimulating properties in the preparation. The remarkable clinical success of Dentinol is due to the fact that it exercises these three qualities in a most effective manner.

The germicidal effect of Dentinol has been secured in a most effective and beneficial manner, by the presence of germicides sufficiently powerful to overcome the germ life characteristic of pyorrhea, without the slightest injurious effect on the tissues. It would be very easy to select germicides which would be fatal to micro-organisms and at the same time injurious to the debilitated tissues, but he who hopes for the greatest success in treating pyorrhea must carefully avoid the use of such medicaments.

The astringent action of Dentinol is of the greatest value to him who would treat pyorrhea properly, for he must not only remove the sources of irritation to

the tissues and free the pockets of pathogenic micro-organisms, but he must aid nature in re-establishing a healthy tone in the debilitated tissues.

It is characteristic of inflamed tissues that the cells are overloaded with exudates which are present in abnormal quantities. Frequently the capillary walls are ruptured by over-distension, making the escape of exudates into the tissues very easy.

The astringent action of Dentinol so changes the exudates present in the cells that they can be easily taken up by the circulatory system when that has been sufficiently stimulated. This action also aids in the repair of ruptures in the capillary walls. As the ingredients of Dentinol are very penetrating, these benefits are not confined to the cells lying near the surface treated, but are also exerted deep within the tissue. It need hardly be said that this action is most important in the restoration of the tissues to health.

It is, of course, essential to the restoration of tissues to health that the circulatory system, which has been debilitated, shall be enabled to resume its normal function. It must take up the exudates which have been made more diffusible by the action of the astringents. It must bring new blood, laden with healthy tissue building material and oxygen. Dentinol accomplishes these ends in the only manner known to be safe. It is a volatile preparation and enters the cells only for a time, acting as a stimulant, and then leaving the cell to perform its own functions with increased vigor. If it were to form chemical unions with the contents of the cells, that would mean ultimate cell destruction, an end to be avoided. But when its stimulating effect has been exerted, it passes off into the circulation. The next application of Dentinol is designed to occur at a time when the awakening cell is in need of further assistance.

HOME TREATMENT AS AN ADJUNCT TO OFFICE TREATMENT

Experience has clearly shown that unless intelligent home treatment is conducted by the patient, the dentist's treatments will be much less effective and perhaps unsuccessful. This home treatment should be under the direction of the dentist and should harmonize in character with that given in the office.

To this end a modified form of Dentinol, suitable for home use by the patient, has been made under the name PYORRHOCIDE. In Pyorrhocide, Dentinol is combined with White Oak, Elm, and Peruvian Barks, and Precipitated Chalk (soluble granulation).

The use of Pyorrhocide morning and evening continues the medicinal treatment begun by the dentist, only in a milder form, and renders far more certain the benefits sought. Dentinol is present in Pyorrhocide in a strength more than sufficient to prevent the growth and activities of the pus-producing and other destructive organisms, as shown in the table of bacteriological tests. The precipiated chalk breaks up the deposits which form on the teeth and aids in their removal. The barks exercise a cleansing and polishing action which leaves the tooth surfaces smooth, also a medicinal benefit of no small importance to the soft tissues.

Pyorrhocide is used on a moist but not wet brush of proper form. When a section of the mouth, as from cuspid to molars, has been cleansed, the brush should be charged with fresh powder. Patients should be instructed to brush the lingual and labial surfaces of the upper teeth from above downward, and of the lower teeth from below upward. They should be told also that the habit of brushing the gums with Pyorrhocide will aid in securing its medicinal benefits and hasten the return of normal tone to the tissues. This is also one of the very best means of maintaining mouth health, once it is secured.

PREVENTION

By the use of preventive measures we approach more closely the desired condition of absolute cleanliness, and the more we reduce tooth decay and diseases of the gums. By the proper cleaning of the teeth by the patient, the food débris, which furnishes such excellent media for bacteria to grow upon and which cause tooth decay and harmful effects to the gum tissue, is removed, thus producing an environment unfavorable to bacteria growth.

Bacteria find a most favorable place for lodgment in the cavities of the teeth beneath the free margin of the gums and in the hard deposit found upon the teeth.

Frequently teeth, with no evidence of decay, are lost as a result of an inflammation, simple at first, but allowed to progress through lack of preventive measures.

To a very large extent the success attained in the treatment of pyorrhea and its prevention is due to the diligent home treatment by the patient.

The greatest factor, conducive to the promotion of health about the roots of teeth and maintenance of this health, is the proper use of the tooth brush and powder. This establishes a good circulation in the tissues surrounding the roots and raises the resistance of the gum tissues and peridental membrane.

To keep the tissues surrounding the roots or foundations of teeth in a state of health is to eliminate the greatest source of lost teeth and is of vital importance in the saving of these important organs. By the preservation of the teeth the main portal for the entrance of food into the digestive tract is able to perform that function which has so important a bearing upon the general health of the patient.

Preventive measures used by the dentist should consist of a thorough examination of all tooth surfaces and especially those surfaces of the teeth which are hidden by the loose fold of the free margin of the gum, should receive particular attention.

The thorough removal of all deposits and the polishing of these surfaces to reduce the chance for further accumulation is of inestimable value in preserving teeth. Particular attention should be given to the ligual surfaces of the lower incisors and the buccal surfaces of the upper molars, for the hard deposits tend to accumulate at these points more rapidly. All crowns and bridges should be carefully examined and corrected if causing trouble of any nature. During sickness preventive treatment should be resorted to, for at this time danger of trouble increases due to lowered powers of resistance.

Patients should be instructed to brush the gums as well as the teeth and impressed with the necessity of an occasional visit to the dentist in order that those surfaces which are not reached with the brush and powder may be properly cared for at the office.

CONDENSED TREATMENT FOR PYORRHEA

Look for the causes of inflammation:

(a) Deposits.
(b) Mal-occlusion.
(c) Excessive occlusion.
(d) Faulty crowns or fillings.

Remove all these causes.

Flush all pockets with Peroxide of Hydrogen or distilled water.

Place cotton rolls on the lingual and labial surfaces of the pockets to be treated.

Flood the pockets with Dentinol, by means of the Dentinol Perfect Syringe. Repeat at each sitting until tissues have become healthy.

Pyorrhocide should be used by patients during treatment and afterward to maintain mouth health.

ATTENTION

If you prefer to prescribe *Pyorrhocide* for patients' use, rather than dispense it from the office, your dental salesman will be pleased to sell you a $1.00 bottle of Dentinol and arrange with your druggist to supply patients with Pyorrhocide on your prescription. It is, however, advantageous to have Pyorrhocide on hand to be supplied to Pyorrhea patients on whom treatment is to be commenced.

Dentinol

(Applied by the dentist)

2-ounce Bottle . . . . . Price $1.00

DENTINOL CONTAINS

CRESOL (refined)
OIL BIRCH
OIL CAMPHOR
OIL CAPSICUM
OIL EUCALYPTUS
OIL SASSAFRAS
OIL TURPENTINE
ALCOHOL
ETHER 5 PER CENT.

NON-INJURIOUS—NON-ACID

Dentinol is an antiseptic, stimulant, and astringent and is valuable in treatment of all inflammatory conditions of the oral cavity.

ological tests by scientists of national reputation prove th most powerful germicide and antiseptic that can be us t injury to the tissues.

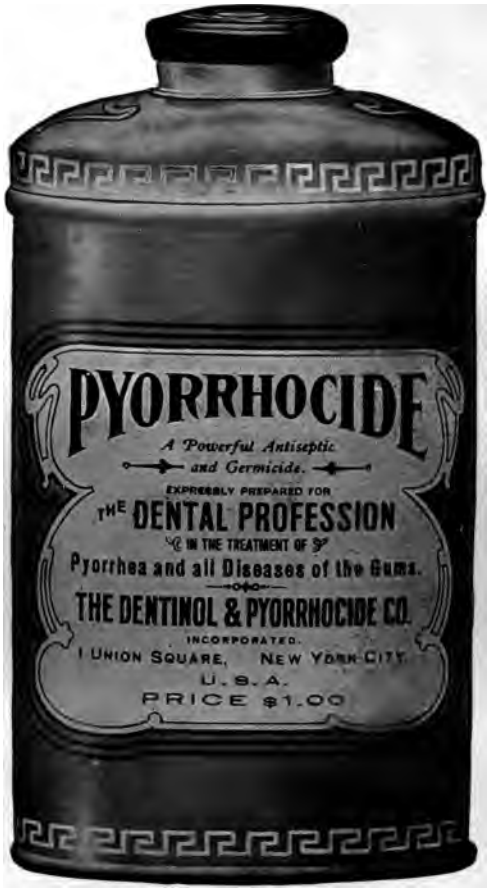
For Sale at all

Pyorrhocide

(Used by the patient)

4-ounce Can . . . . . Price $1.00

N. B.—Quantity rates to dentists obtainable at *Dental Depots Only.*



N. B.—Write for quantity of prescription blanks and pamphlets on *Mouth Health* for distribution to patients.

PYORRHOCIDE CONTAINS

PRECIPITATED CHALK (Soluble Granulation)
PERUVIAN BARK WHITE OAK BARK ELM BARK and
DENTINOL IN A MODIFIED FORM

Pyorrhocide used as a dentifrice prevents the daily formation of mucoid deposits upon the teeth without injuring the tooth structure or soft tissues and stimulates the tissue cells to a greater power of resistance to bacteria.

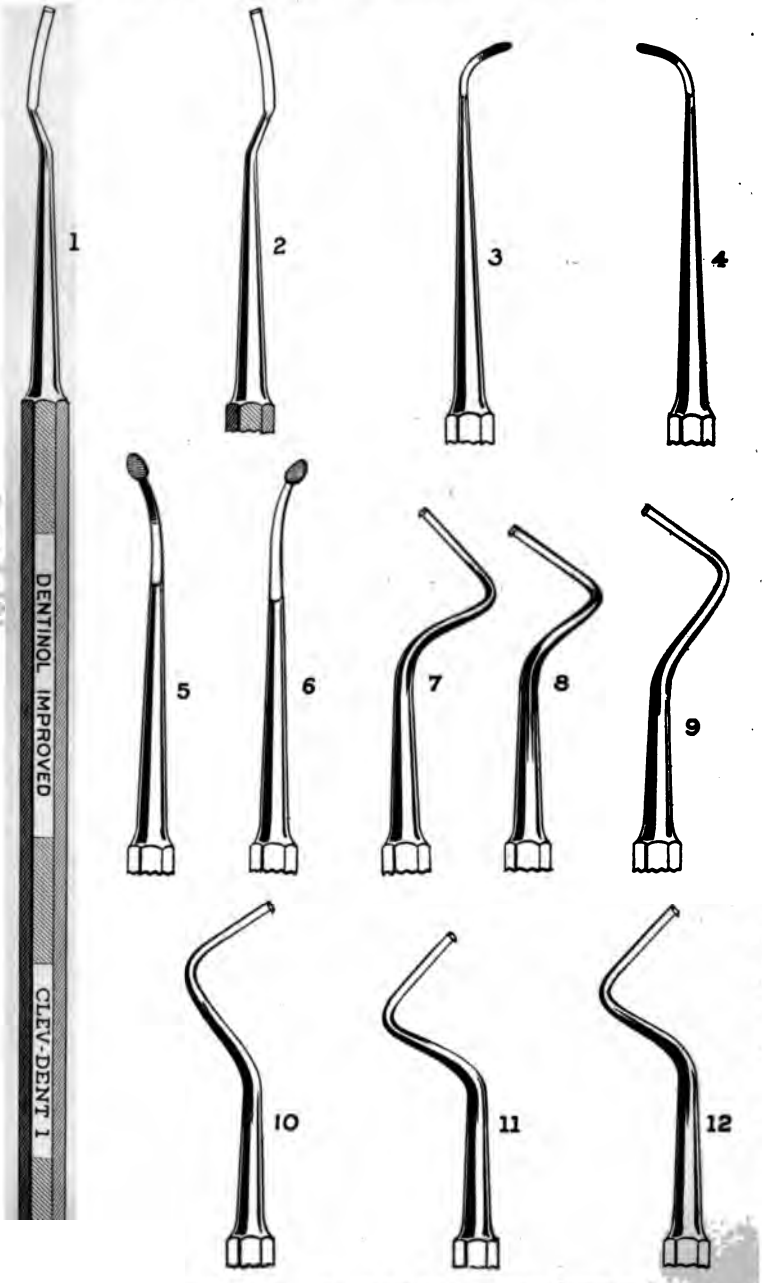
Patients using Pyorrhocide as a dentifrice appreciate the value of a clean, healthy mouth over an unhealthy one disguised with flavor and perfume.

N. B.—Prescriptions for Pyorrhocide can be filled at first-class Drug Stores.

Improved Dentinol Pyorrhea Sc

PRICE PER SET (12 instruments) $9.00

uments Nos. 7-8-9-10-11-12, used in rotation, completely encircle roots of posterior teeth out change of position of operator. The same positive rest on anterior teeth is maintained in the use of each instrument.



t removal deposits is simplifi

HE DENTINOL & PYORRHOCIDE CO.

WORLD'S TOWER BUILDING, NEW YORK CITY

The angles of these files are identical with those of the corresponding scalers; the extra fine serations on these files facilitate the smoothing of root surfaces. The scalers should be used in the removal of heavy deposits.

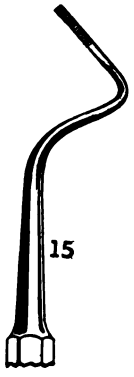
"Improved Dentinol" Prophylactic Files

PRICE PER SET (8 Files) $8.00

13

No. 13	File	corresponds	to	No. 1	scaler
No. 14	"	"	"	2	"
No. 15	"	"	"	7	"
No. 16	"	"	"	8	"
No. 17	"	"	"	9	"
No. 18	"	"	"	10	"
No. 19	"	"	"	11	"
No. 20	"	"	"	12	"

14



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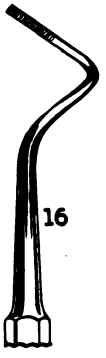

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SOLD BY ALL DENTAL DEPOTS

The angles of the "Improved Dentinol" Scalers and Files are the result of years of study devoted exclusively to pyorrhea treatment and prevention. The steel, temper and finish are the best obtainable.

SCALERS

Peculiar advantages result to these instruments from the fact that they were selected by one who possesses a practical knowledge of treating pyorrhea. The shank of each instrument is curved in such fashion that it may rest on the crown of the tooth, the curve may pass around the bulge of the crown and the cutting edge come properly against the root. That portion of the shank intended to rest on the crown is flattened to afford stable support. The cutting edge is given the bevel which makes it most effective. The corners of all blades are rounded by hand on oil stones to insure that they shall not lacerate the soft tissues.

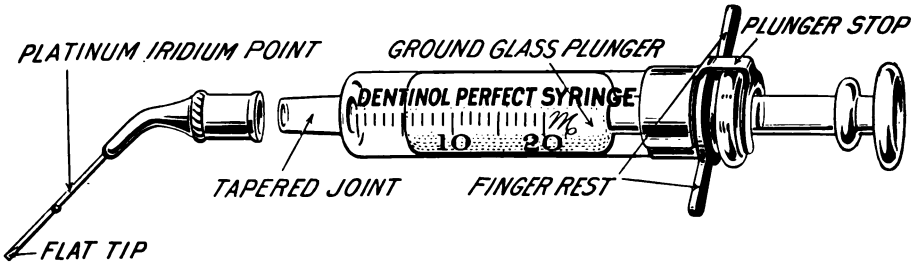
Especial care is taken in tempering these instruments to avoid brittleness. They will be found hard and tough and free from the water checks so often found in instruments of this sort.

FILES

The Improved Dentinol Prophylactic Files are of especial advantage in smoothing root surfaces as the gums become constricted around affected teeth; the thin blades and fine serrations enable the operator to continue prophylactic treatment without retarding the healing process.

The Dentinol Perfect Syringe

Price $2.50



In using the Dentinol Perfect Syringe always keep the "flat tip" of the point flat against the root, **thus** reaching the depth of pockets with least irritation to gum tissues.

This is the accepted and approved all-glass syringe. The plunger is ground to fit the barrel and as shown in the illustration is supplied with finger rests and plunger stop to prevent the plunger from falling or dropping out. Each plunger is ground to meet the individual requirements of the barrel in which it is used. It is thoroughly aseptic and can be easily sterilized by boiling or in solution. The needle is of iridio-platinum and has a "flat tip," which is a very important feature, as it allows a greater contact to the root with less liability of slipping off into the soft tissues. The tip of the needle, being flat, does not scratch or injure the tissue as it is passed into the pocket. By its use Dentinol can be carried to the depth of any pocket.

This imported glass stoppered bottle is both convenient and ornamental, and is found useful as a container for Dentinol in daily use.

Price 40 cents